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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 48 JULY 7, 1933 No. 27

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES[1]

May 21–June 17, 1933

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease."

Typhoid fever.—An increase in typhoid fever incidence was noted in all sections of the country except the Mountain and Pacific areas. Of the 1,357 cases, the South Atlantic group reported 385 and the South Central groups 511—about two thirds of the total number. These numbers were more than twice those reported for the preceding 4-week period.

For the country as a whole, the incidence was slightly higher than for the same period in any of the 3 preceding years but was below that of 1929. In individual areas there were wide variations. In the Atlantic coast and Great Lakes regions the current incidence followed the average for recent years very closely, in the South Central sections it was somewhat higher than the average, while in the far western areas it was the lowest for this period in recent years.

Measles.—The incidence of measles dropped about 30 percent from the preceding 4-week period during the current period. For the whole reporting area the cases totaled 49,124, which was the lowest for this same period in the 5 years for which data are available.

A comparison of geographic areas shows that the disease is most prevalent this year in the West North Central and South Central areas, with slight increases over last year in the South Atlantic and Pacific sections. In the West North Central States the number of cases (4,115) reported for the current period was 2.5 times that of last year, and in each of the South Central areas the numbers (955 and 3,811) were 5 times that of last year. In the New England

[1] From the Office of Statistical Investigations, U.S. Public Health Service. The numbers of States included for the various diseases are as follows: Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 47, diphtheria, 48; scarlet fever, 48, influenza, 38 States and New York City. The District of Columbia is counted as a State in these reports.

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States the number of cases (3,826) was only about 55 percent of the number reported last year, and in the East North Central the number (8,715) was only 31 percent of that for last year.

Diphtheria.—Diphtheria cases (1,857) reported for the current period represented a decline of approximately 26 percent from last year's figure and 40 percent from that for the corresponding period in 1931. For the country as a whole the incidence was the lowest for this period in the 5 years for which data are available. A similar situation existed in each geographic area except the South Central areas. In those sections, while the current incidence was slightly lower than last year, it was higher than in either of the 3 preceding years.

Meningococcus meningitis.—The incidence of meningitis continued very favorable in all sections of the country. For the 4-week period ended June 17 the cases totaled 202, as compared with 216, 338, and 499 for the same periods in the years 1932, 1931, and 1930, respectively. For this period in 1929 the cases totaled 919. Illinois, in the East North Central section, seemed mostly responsible for an appreciable increase over last year in that area. For Illinois 54 cases were reported for the current period, as against 21 last year. All other areas closely approximated last year's incidence.

Smallpox.—For smallpox the comparison with recent years was very favorable. The number of cases reported (519) was only 58 percent of that reported for the corresponding period last year and 17 percent of the number in 1931. For the same period in 1930 and 1929 the cases totaled 4,042 and 3,775, respectively. With one exception—the Pacific—all areas reported decreases from last year's figure. Oregon and California, in the Pacific area, reported 67 and 97 cases, respectively, for the current period, as against 31 and 46 cases last year.

Scarlet fever.—The incidence of scarlet fever dropped from 21,144 for the preceding 4 weeks to 14,846 for the current 4-week period. Each geographic area shared in the decline. The incidence was a little below that of last year and very closely approximated the average for recent years. In the North Atlantic States, where the disease was unusually prevalent at this time last year, the current incidence was only about 68 percent of last year's figure. Figures from other areas followed very closely those of last year.

Poliomyelitis.—The number of cases of poliomyelitis reported for the current period was 61, as against 108, 124, and 189 for the corresponding period in the years 1932, 1931, and 1930, respectively. The current incidence was the lowest for this period in recent years. In the 3 preceding years the number of cases reported for this period represented very appreciable increases over the preceding 4-week period, while the current incidence was 20 percent below that of the

preceding 4-week period. Each geographic area shared in the favorable situation which prevailed.

Influenza.—The influenza incidence declined approximately 50 percent during the 4 weeks ended June 17. The number of cases (1,509) was about 65 percent of the number reported for the corresponding period in 1932, when the minor epidemic of that year was still in evidence, and was slightly below the average for the 3 preceding years. Ohio, in the East North Central area, and Texas, in the West South Central area, seemed mostly responsible for increases in those areas over the same period last year. The number of cases, however, was not large in either State. All other areas reported decreases.

Mortality, all causes.—The average death rate from all causes in large cities, as reported by the Bureau of the Census, for the 4 weeks ended June 17, 1933, was 10.6 per thousand population (annual basis), which was not only the lowest rate for the current year but was below any rate for the corresponding period in recent years.

SICKNESS AMONG MALE INDUSTRIAL EMPLOYEES DURING THE FIRST QUARTER OF 1933 [1]

The incidence rate of disabilities lasting 8 calendar days or longer among industrial employees in 33 identical establishments [1] in the first quarter of 1933 was practically the same as for the first quarter of 1932.

The frequency of diseases of the respiratory system was slightly higher in the first quarter of 1933, because of the prevalence of influenza. However, influenza combined with bronchitis gave an annual rate per 1,000 men of 45.4 in 1933, as compared with 43.1 in 1932, so that the actual difference in rates was not great.

The pneumonia rate in 1933, which was somewhat above the rate for the same quarter in 1932, remained far below the rates for 1931 and 1930.

The tuberculosis case rate showed a decline in this group. At the end of the first quarter of 1933 the Metropolitan Life Insurance Co.[2] showed a drop of 2.8 percent from the death rate for the same quarter of the preceding year.

Although diseases of the pharynx and tonsils occurred at approximately the same rate as in the first quarter of 1932, their incidence was far below that of both 1931 and 1930.

[1] Establishments are scattered all over the United States, but most of them are located north of the Ohio and the Potomac Rivers and east of the Mississippi.

[2] Statistical Bulletin, Metropolitan Life Insurance Co., vol. XIV, no. 4, April 1933, pp. 4-5.

The nonrespiratory group of diseases as a whole showed the same rate in 1933, 1932, and 1931. This rate was lower than in the same quarter of 1930.

Diseases of the stomach, diarrhea and enteritis, appendicitis, hernia, and epidemic and endemic diseases continued to show a downward trend in frequency.

The rheumatic group of diseases showed very little difference in the incidence rates in the same quarter of the past 4 years, especially when it is taken into consideration that weather conditions affect these rates to some extent.

The frequency rate of neurasthenia indicated a decline in 1933, but "other diseases of the nervous system" rose to a high level, and there may have been some difference in reporting these diseases. The rates for neurasthenia and "other diseases of the nervous system", when added, did not show a definite change in rates. The rates for the first quarter for the past 4 years, respectively, are 2.8, 2.6, 2.2, and 2.4 cases per 1,000 men.

Diseases of the heart and arteries and nephritis rose to a higher frequency rate in 1933 than in the similar period of each of the 3 preceding years. The Metropolitan Life Insurance Co. reports for the first 3 months of 1933 an upward trend in cardiac conditions, and death rates in 1933 bid fair to exceed the previous maximum, which was reached in 1932.

TABLE 1.—*Frequency of disability lasting 8 calendar days or longer in the first quarter of 1933 compared with the same quarter of 1932, 1931, and 1930. (Male morbidity experience of 33 industrial companies which reported their cases to the United States Public Health Service during all four years)* [1]

Diseases and disease groups which caused disability. (Numbers in parentheses are disease title numbers from the International List of the Causes of Death, Fourth Revision, Paris, 1929)	Annual number of disabilities per 1,000 men in first quarter of—			
	1933	1932	1931	1930
Sickness and nonindustrial injuries [2]	119.9	119.1	135.5	117.0
Nonindustrial injuries	10.5	11.1	10.6	11.4
Sickness	109.4	108.0	124.9	105.7
Respiratory diseases	59.7	58.3	75.2	50.4
Influenza and grippe (11)	41.7	36.7	50.7	22.9
Bronchitis, acute and chronic (106)	3.7	6.4	6.1	7.0
Pneumonia, all forms (107–109)	2.9	2.0	4.1	4.7
Diseases of the pharynx and tonsils (115a)	5.7	5.8	7.1	8.6
Tuberculosis of the respiratory system (23)	.7	1.0	1.3	1.1
Other respiratory diseases, (104, 105, 110–114)	5.0	5.8	5.9	6.1
Nonrespiratory diseases	49.7	49.7	49.7	55.2
Diseases of the stomach, cancer excepted (117, 118)	3.4	4.2	3.8	4.8
Diarrhea and enteritis (120)	.8	1.0	.7	1.2
Appendicitis (121)	3.0	3.3	3.7	4.3
Hernia (122a)	1.6	1.9	1.9	1.9
Other digestive diseases (115b, 116, 122b–129)	3.7	2.9	2.9	3.3
Rheumatic group, total	13.3	13.6	12.4	13.0
Rheumatism, acute and chronic (56–57)	7.4	6.4	6.3	6.6
Diseases of the organs of locomotion (156b)	3.2	4.6	3.7	3.8
Neuralgia, neuritis, sciatica (87a)	2.7	2.6	2.4	2.6
Neurasthenia and the like (part of 87b)	.7	1.3	1.4	1.4
Other diseases of the nervous system (78–85, part of 87b)	1.7	.9	1.2	1.4

[1] Except that the rates for 1931 and 1930 cover 27 and 26 companies, respectively, instead of 33 in 1932 and 1933.

[2] Exclusive of disability from venereal diseases.

TABLE 1.—*Frequency of disability lasting 8 calendar days or longer in the first quarter of 1933 compared with the same quarter of 1932, 1931, and 1930. (Male morbidity experience of 33 industrial companies which reported their cases to the United States Public Health Service during all four years)*—Continued

Diseases and disease groups which caused disability. (Numbers in parentheses are disease title numbers from the International List of the Causes of Death, Fourth Revision, Paris, 1929)	Annual number of disabilities per 1,000 men in first quarter of—			
	1933	1932	1931	1930
Diseases of the heart and arteries and nephritis (90–99, 102, 130–132)	5.1	3.7	4.2	4.7
Other genito-urinary diseases (133–138)	1.9	2.1	2.6	2.2
Diseases of the skin (151–153)	2.5	2.3	2.7	3.6
Epidemic and endemic diseases except influenza (1–10, 12–18, 33, 37, 38, part of 39 and 44)	2.9	3.0	3.1	3.6
Ill-defined and unknown causes (200)	2.2	2.1	1.7	2.3
All other diseases (19–22, 24–32, 36, part of 39 and 44, 40–43, 45–55, 58–77, 88, 89, 100, 101, 103, 154–156a, 157, 162)	6.9	7.4	7.4	7.5
Average number of males covered in the record	119,714	146,990	158,891	161,642
Number of companies included	33	33	27	26

ROCKY MOUNTAIN SPOTTED FEVER: SUSCEPTIBILITY OF THE DOG AND SHEEP TO THE VIRUS

By L. F. BADGER, *Passed Assistant Surgeon, United States Public Health Service*

SUSCEPTIBILITY OF THE DOG

The experiments here reported show the dog to be susceptible to the virus of Rocky Mountain spotted fever. The virus employed in these tests was of the virulent Bitterroot Valley type.

Dog no. 1, weight 21 pounds, was inoculated intraperitoneally with 5 cc of whole cardiac blood obtained from a guinea pig in the second day of reaction following inoculation with the virus of Rocky Mountain spotted fever. The temperature of the dog was taken twice daily for 15 days and with the exception of a reading of 39.8° C. on the morning of the third day, the temperature remained normal. At the time that the dog was inoculated, four fresh male guinea pigs received intraperitoneally 2 cc of the same blood which was used in inoculating the dog. Each of the guinea pigs responded to the inoculations with a typical spotted fever reaction after incubation periods of 2 days.

On the fourth day after inoculation of dog 1, two male guinea pigs were inoculated intraperitoneally with 3 cc of whole blood obtained from a leg vein of this dog. One of these guinea pigs failed to react clinically to the inoculation and was found to be nonimmune to a subsequent inoculation of the virus. The other guinea pig, after an incubation of 6 days, became febrile. This guinea pig was killed on the second day of fever and two fresh male guinea pigs were each inoculated intraperitoneally with 5 cc of its whole cardiac blood. By this means a strain of the virus was established and carried in guinea pigs for 5 generations.

On the sixth day after inoculation of the dog the procedure was repeated and a strain of the virus was again established in guinea pigs.

Attempts to recover the virus from dog 1 on the eighth and tenth days were unsuccessful.

Dog no. 2, weight 17 pounds, was inoculated intraperitoneally with 4 cc of whole cardiac blood obtained from a guinea pig on the second day of reaction following inoculation with a virus of Rocky Mountain spotted fever. The temperature of dog 2 was taken twice daily for 15 days, and remained normal throughout this period. At the time that this dog was inoculated, four fresh male guinea pigs received intraperitoneally 2 cc of the same blood with which the dog was inoculated. Each of the guinea pigs reacted with clinical manifestations typical of Rocky Mountain spotted fever. Guinea pigs were inoculated with whole blood obtained from dog 2 on the fourth, sixth, eighth, and tenth days, respectively, following the inoculation of the dog. Strains of the virus of spotted fever were established in guinea pigs with the blood obtained on the fourth, sixth, and eighth day, but not on the tenth day.

Twenty-nine days after receiving the first inoculation, dogs 1 and 2 were again inoculated intraperitoneally with 5 cc of whole cardiac blood obtained from guinea pigs in the second day of reaction due to the virus of Rocky Mountain spotted fever. Guinea pigs which were inoculated intraperitoneally with 2 cc of the same blood with which the dogs were inoculated reacted typically. Attempts to recover the virus from dogs 1 and 2 on the fourth and sixth days following this second inoculation were unsuccessful.

To determine whether multiplication of the virus took place in the dogs a third dog was inoculated. Dog no. 3, weight 12 pounds, received intraperitoneally 5 cc of whole cardiac blood obtained from a guinea pig on the second day of a reaction produced by the virus of Rocky Mountain spotted fever. This dog became febrile 24 hours after the inoculation and with the onset of fever developed a cough. With the return of the temperature to normal, the cough subsided. Four male guinea pigs which were inoculated as controls reacted typically. Attempts to recover the virus from dog 3 on the first and second days after the inoculation failed, while an attempt to recover the virus on the fourth day was successful.

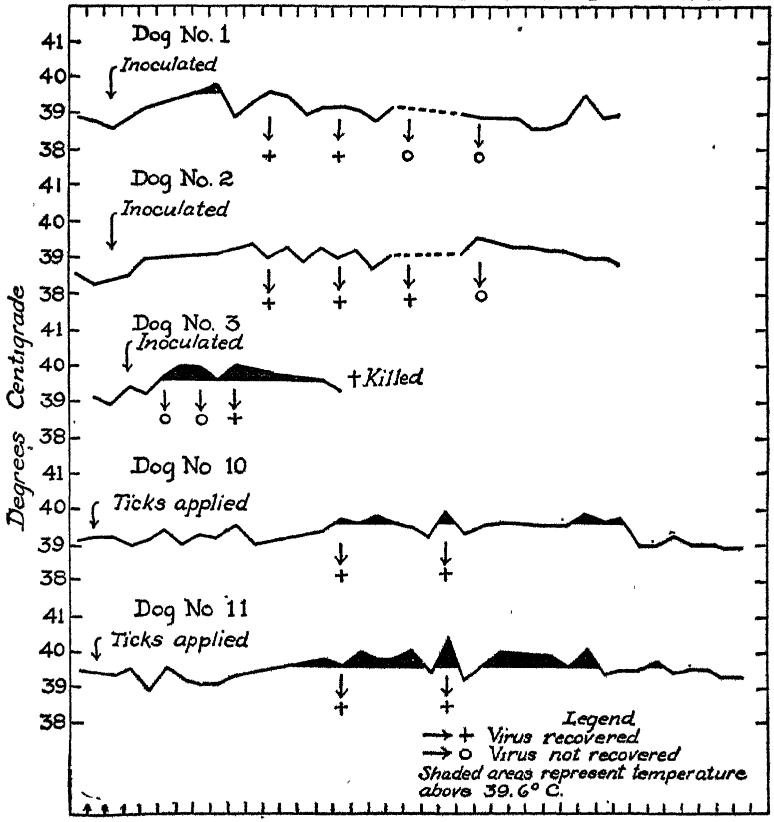
It has also been shown that dogs may be infected with Rocky Mountain spotted fever by the bite of ticks infected with the virus. Infected *Dermacentor andersoni* ticks were allowed to feed on two puppies. Both puppies reacted to the feeding and the virus was recovered from each and established in guinea pigs.

On dog no. 10, weight 10.5 pounds, unengorged infected male and female *D. andersoni* ticks were allowed to feed. On the seventh day after application the ticks were removed, emulsified, and inoculated

into two fresh male guinea pigs. These guinea pigs responded to the inoculations with reactions typical of Rocky Mountain spotted fever. At the time of removal the female ticks were approximately one half engorged. On the seventh day after the ticks had been applied this puppy became febrile and, with the onset of fever, developed a cough and a slight coryza. With the return of the temperature to normal these symptoms subsided.

On the seventh day after the ticks had been applied and the first day of fever, dog 10 was bled from a leg vein and two fresh male

DAILY TEMPERATURE RECORDS OF DOGS INFECTED WITH THE VIRUS OF ROCKY MOUNTAIN SPOTTED FEVER.



guinea pigs were each inoculated intraperitoneally with 3 cc of the whole blood. One of these guinea pigs became febrile after an incubation period of 3 days, and from this animal a strain of the virus was established in guinea pigs.

On the tenth day after the application of the ticks and the fourth day of fever the procedure was repeated and a strain of the virus was again established in guinea pigs.

On dog no. 11, weight 8.5 pounds, the experiment performed with dog 10 was repeated, and the virus was established in guinea pigs with blood obtained from this dog on the seventh and tenth days after the application of the ticks (second and fourth days of fever). On the sixth day after the ticks had been applied this puppy became febrile and, with the onset of fever, developed a cough. With the return of the temperature to normal, the cough subsided.

A dog raised in a known endemic area of spotted fever was inoculated intraperitoneally with 5 cc of blood obtained from a guinea pig on the second day of a reaction due to the virus of Rocky Mountain spotted fever. Attempts to recover the virus from this dog on the fourth and sixth days after the inoculation were unsuccessful. Guinea pigs inoculated with some of the blood with which this dog was inoculated reacted with symptoms typical of spotted fever. This dog was apparently immune to the virus.

That the strains of virus established in guinea pigs from these dogs were strains of Rocky Mountain spotted fever virus was proved by the fact that they produced (1) clinical reactions, typical of spotted fever, in guinea pigs and rabbits, (2) agglutinins for *B. proteus* X_{19} (type O) in rabbits, and (3) complete cross immunity with a known virus of Rocky Mountain spotted fever.

The febrile reactions in the dogs are shown in the accompanying chart.

The Weil-Felix reaction with the sera of these dogs was negative, with the exception of that of dog no. 11, which completely agglutinated *B. proteus* X_{19} (type O) in the titer of 1:80.

SUSCEPTIBILITY OF SHEEP

A young sheep has likewise been shown to be susceptible to the virus of Rocky Mountain spotted fever. A lamb born after the close of the tick season was utilized in the experiment in order to rule out an acquired immunity to the virus resulting from bites of infected ticks in nature.

This lamb was inoculated with 10 cc of whole cardiac blood obtained from guinea pigs in the third day of reaction due to the virus of Rocky Mountain spotted fever. On the fourth, sixth, eighth, and tenth days after the inoculation the lamb was bled from a leg vein and guinea pigs were inoculated intraperitoneally with whole blood. Two guinea pigs were inoculated with 3 cc of the blood at each bleeding. Strains of Rocky Mountain spotted fever virus were established in guinea pigs with the blood of this lamb drawn on each of the days mentioned. That the strains of virus thus established in guinea pigs were strains of spotted fever virus was proved by the fact that they produced (1) clinical symptoms in the guinea pig and rabbit typical of spotted fever; (2) agglutinins for *B. proteus* X_{19}

(type O) in rabbits, and (3) cross immunity with a known strain of spotted fever virus.

On the eighth day after the inoculation the serum of the lamb produced complete agglutination of *B. proteus* X_{19} (type O) in the titer at 1:640.

SUMMARY

Three dogs, 2 grown and 1 puppy, were inoculated with the virus of Rocky Mountain spotted fever. The inoculations produced no clinical manifestations in the larger dogs, while the puppy reacted with fever and respiratory symptoms.

From one of the larger dogs the virus was recovered on the fourth and sixth days and not on the eighth and tenth days after the inoculations, while from the other the virus was recovered on the fourth, sixth, and eighth days and not on the tenth day after the inoculation.

Attempts to recover the virus from the puppy on the first and second days after inoculation failed, while an attempt on the fourth day was successful.

The two larger dogs were reinoculated with the virus 29 days after receiving the first inoculation. Attempts to recover the virus from these dogs on the fourth and sixth days after the second inoculation failed. The first inoculations apparently conferred immunity in these dogs to subsequent inoculations.

A grown dog, raised in an endemic area of spotted fever, was apparently immune to the virus.

Dermacentor andersoni ticks infected with the virus of Rocky Mountain spotted fever were fed on two puppies. After incubation periods of 5 and 6 days the puppies developed clinical manifestations and the virus of spotted fever was recovered from each.

A young sheep, born after the close of the tick season, was inoculated with the virus of Rocky Mountain spotted fever. The virus of spotted fever was recovered from this sheep on the fourth, sixth, eighth, and tenth days after the inoculation.

TYPHUS FEVER

Experimental Transmission of Endemic Typhus Fever of the United States by *Xenopsylla astia*

By W. G. Workman, *Assistant Surgeon, United States Public Health Service, National Institute of Health*

The studies reported in this paper were carried out to determine the capacity of the rat flea *Xenopsylla astia* to serve as a vector of endemic typus fever of the United States under experimental conditions. That *X. cheopis* (1) (2) (3) and *Ceratophyllus fasciatus* (4) are vectors of endemic typhus has been demonstrated experimentally.

On the first day of the experiment a lot of approximately 500 noninfected *Xenopsylla astiae* was placed in a clean box labeled A4, and with them white rat W3272 which had been inoculated 7 days before with testicular washings from an endemic typhus guinea pig. Two days later, white rat W3282 inoculated 5 days before from the same strain of endemic typhus, was placed in box A4 but died the following day. White rat W3272 died 7 days after having been placed in box A4.

On the eighth day of the experiment a lot of 24 fleas was removed from box A4, macerated in normal saline, and injected intraperitoneally into four guinea pigs. One of these guinea pigs developed fever in 3 days and each of the other three in 5 days, and all showed scrotal involvement typical of endemic typhus. Strain A was secured by inoculating fresh guinea pigs with blood and testicular washings from one of these guinea pigs on the third day of fever.

On the eighth day of the experiment fresh white rat 10330 was placed in box A4. Eight days later this rat was killed and two guinea pigs were inoculated with the spleen of the rat and two with the brain. Each of the former pair of guinea pigs developed fever in 2 days but did not show scrotal involvement. Each of the latter developed fever in 5 days and showed scrotal involvement, and from one of them in the third day of fever strain AR was secured by inoculating fresh guinea pigs with blood and testicular washings.

Sixteen days after the beginning of the experiment 24 fleas from box A4 were crushed and rubbed into the abraded skin of the belly of each of four guinea pigs. Three of these developed fever in 5 days and one in 7 days, but none showed redness or swelling of the scrotum. Strain AB was obtained by inoculating fresh guinea pigs with blood and brain from one of the guinea pigs on the fifth day of fever.

On the sixteenth day of the experiment 50 fleas from box A4 were placed in a test tube and allowed to remain overnight. On the next day the feces which had been deposited in the test tube were suspended in normal saline and injected intraperitoneally into two guinea pigs. Each of these became febrile after 5 days and developed redness and swelling of the scrotum. Strain AFF was obtained from one of these on the first day of fever by the intraperitoneal inoculation of blood and testicular washings into fresh guinea pigs.

Each of these four strains designated A, AR, AB, and AFF was identified as endemic typhus by the criteria previously stated (4), namely, clinical course in the guinea pigs, negative blood cultures, the presence of *Rickettsiae*, the Weil-Felix reaction, brain pathology, and cross-immunity tests.

Each strain was carried for a time sufficiently long for its behavior to be observed carefully. Strain A was carried 8 generations, strain AR 11 generations, strain AB 14 generations, and strain AFF 11

generations. No clinical difference was observed between any of the experimental strains and the original strain of endemic typhus. Blood cultures made at the time of transfer were negative in most instances. In each strain *Rickettsiae* were observed in the cytoplasm of epithelial cells of the tunica vaginalis when stained with Giemsa stain. Two or more guinea pigs from each strain showed the presence of typhus nodes in the brain.

Rabbits, whose sera had previously been tested against *Bacillus proteus* X_{19} and none of which gave agglutination in a dilution greater than 1–10, were inoculated intraperitoneally at the time of the routine transfer with testicular washings from guinea pigs of each strain. The sera of these rabbits after inoculation gave agglutination against *B. proteus* X_{19} in the following dilutions: Strain A, 1–160, 1–320; strain AR, 1–160, 1–320; strain AB, 1–160, 1–160, 1–320; and strain AFF 1–160, 1–320, 1–320. Each dilution named represented a different rabbit.

An immunity test was considered satisfactory when each of two fresh guinea pigs reacted typically with fever and scrotal involvement and when neither of two recovered guinea pigs inoculated with the same amount of the same virus developed fever or scrotal involvement within 14 days. In the case of each strain satisfactory immunity tests were obtained with guinea pigs recovered from known endemic typhus and reinoculated with experimental strain virus, and satisfactory tests were also obtained with recovered experimental guinea pigs reinoculated with known endemic typhus virus.

SUMMARY

It was shown that the rat flea, *Xenopsylla astia* was capable of becoming infected with endemic typhus virus. Transmission of endemic typhus from an infected white rat to a noninfected white rat was accomplished by *X. astia*. Crushed infected fleas rubbed upon the abraded skin produced endemic typhus in the guinea pig. Feces collected from infected fleas were shown to contain the virus of endemic typhus.

ACKNOWLEDGMENT

Thanks are due Surg. R. D. Lillie for histologic examinations of brain tissue.

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(4) ——— Workman, G. W., Badger, L. F., and Rumreich, A.: Pub. Health Rep., 47: 931, Apr. 22, 1932.

COURT DECISION RELATING TO PUBLIC HEALTH

Vital statistics act held to give State board of health power to appoint local registrar.—(Colorado Supreme Court; *McNicols, Auditor of City and County of Denver,* v. *People ex rel. Hershey,* 22 P. (2d) 131; decided May 1, 1933.) The Colorado vital statistics statute of 1907 vested in the State board of health the power to appoint a local registrar of vital statistics for each registration district. It provided, however, "That in cities * * * where health officers or secretaries of local boards of health or other officials at the date of this act are officiating as registrars of births and deaths under local ordinances which [such] officers shall be continued as registrars in and for such cities * * * but shall be subject to the rules and regulations of the State registrar and to all the provisions of this act." When the 1907 act became effective, a municipal officer known as the commissioner of health was officiating as registrar in Denver under an ordinance of 1875. In 1916 the Denver charter was amended and since that time a municipal officer known as the manager of health and charity had officiated as registrar, acting, it was said, under the 1875 ordinance. It was evident that the personnel had changed from time to time and that the term of office of the person who acted as registrar when the 1907 act became effective, whether title to the office was claimed under the ordinance or the statute, had expired long prior to September 29, 1929, on which date the State board of health appointed Hershey, the relator in this case, as local registrar for the Denver district. The relator sought by mandamus to have the auditor of the city and county of Denver audit his claim against the municipality for compensation as local registrar. The supreme court held that he was entitled to an audit of his claim, saying, in part, as follows:

It was the purpose of the act of 1907 to place the State system of registration of births and deaths in charge of the State board of health with power to appoint local registrars for all registration districts in the State. It was known, however, that in some districts there were officials who, at the time the act became effective, were officiating under local ordinances as registrars of births and deaths, and the act provided that those officials should be continued as registrars, subject, however, to the provisions of the act. Section 4 of the act (C.L., sec. 973) fixes the term of office of local registrars at two years "beginning with the first day of January, 1908."

The Denver official who, under the Denver ordinance, was officiating as registrar of births and deaths when the act of 1907 went into effect was continued as registrar, but as such he ceased to be a municipal officer and became an officer of the Denver registration district, a State agency created by the legislature and charged with the administration of governmental duties. People ex rel Hershey v. McNichols, supra [91 Colo. 141, 13 P. (2d) 266]. So far as the local registrar of vital statistics is concerned, the ordinance was superseded by the statute. Under that statute, such local registrar's term of office was two years, commencing January 1, 1908. At the expiration of his term, the power to appoint his successor

resided in the State board of health. The board's neglect to perform its duty in that regard until September 29, 1929, when it appointed Hershey, did not deprive the board of its statutory power or relieve it of the necessity of performing a plain statutory duty.

DEATHS DURING WEEK ENDED JUNE 17, 1933

[From the Weekly Health Index issued by the Bureau of the Census, Department of Commerce]

	Week ended June 17, 1933	Corresponding week, 1932
Data from 85 large cities of the United States:		
Total deaths	7,591	7,112
Deaths per 1,000 population, annual basis	10.6	10.1
Deaths under 1 year of age	541	626
Deaths under 1 year of age per 1,000 estimated live births [1]	47	50
Deaths per 1,000 population, annual basis, first 24 weeks of year	11.6	12.1
Data from industrial insurance companies:		
Policies in force	67,756,926	72,591,928
Number of death claims	12,942	13,184
Death claims per 1,000 policies in force, annual rate	10.0	9.5
Death claims per 1,000 policies, first 24 weeks of year, annual rate	10.5	10.3

[1] 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended June 24, 1933, and June 25, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 24, 1933, and June 25, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 24, 1933	Week ended June 25, 1932	Week ended June 24, 1933	Week ended June 25, 1932	Week ended June 24, 1933	Week ended June 25, 1932	Week ended June 24, 1933	Week ended June 25, 1932
New England States:								
Maine	1	3	1		2	45	0	0
New Hampshire		2			14	27	0	0
Vermont		1			37	116	0	0
Massachusetts	13	33		1	478	828	0	1
Rhode Island	2	5			5	15	0	0
Connecticut	3	4			134	198	0	0
Middle Atlantic States:								
New York	48	79	[1] 6	[1] 5	1,215	1,618	6	6
New Jersey	16	21	1	2	533	592	2	0
Pennsylvania	47	63			826	678	2	1
East North Central States:								
Ohio	16	19	3	8	254	427	0	0
Indiana	11	14	18	10	64	71	1	6
Illinois	17	43	10	19	34	482	8	8
Michigan	30	29		1	343	1,710	2	2
Wisconsin	3	13	14	2	182	877	0	1
West North Central States:								
Minnesota	6	3		1	103	36	1	0
Iowa [2]	6	10			40	3	1	2
Missouri	17	27			93	24	0	2
North Dakota	1				21	35	0	0
South Dakota	4	5				2	0	0
Nebraska		9			7	5	0	0
Kansas	1	4			94	126	1	0
South Atlantic States:								
Delaware		1			5		0	0
Maryland [2 3 4]	3	4	1	2	35	18	0	1
District of Columbia	1	5			16	14	0	0
Virginia [2]	8				174		1	1
West Virginia	6	11		7	87	110	1	0
North Carolina [4]	8	6	5	7	273	415	0	0
South Carolina	2	2	65	186	99	129	0	0
Georgia [4]	11	4		55	120	52	0	0
Florida	8	5	3	2	16	6	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 24, 1933, and June 25, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 24, 1933	Week ended June 25, 1932	Week ended June 24, 1933	Week ended June 25, 1932	Week ended June 24, 1933	Week ended June 25, 1932	Week ended June 24, 1933	Week ended June 25, 1932
East South Central States:								
Kentucky	6	12			20		1	2
Tennessee	4	4	8	9	128	4	1	0
Alabama [4]	7	8	3	12	17	5	1	1
Mississippi	1	4					0	0
West South Central States:								
Arkansas	6			8	91		1	0
Louisiana	8	17	14	13	31	12	1	0
Oklahoma [5]	2	2	11	17	45	28	1	0
Texas [2]	62	18	40	15	202	22	2	0
Mountain States:								
Montana [2]			1	2	44	53	0	0
Idaho [2]		1		1	2	1	0	0
Wyoming [2]		2			2	38	0	1
Colorado [2]	2	4			7	65	0	0
New Mexico	3	5			11	35	0	0
Arizona		3	4	1	31	12	0	0
Utah [3]					60	2	0	0
Pacific States:								
Washington		7			42	133	0	0
Oregon [2]	1	1	11	18	13	116	1	1
California [2]	26	42	10	28	558	283	2	2
Total	417	555	229	432	6,608	9,468	37	33

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 24, 1933	Week ended June 25, 1932	Week ended June 24, 1933	Week ended June 25, 1932	Week ended June 24, 1933	Week ended June 25, 1932	Week ended June 24, 1933	Week ended June 25, 1932
New England States:								
Maine	0	0	7	13	0	0	4	0
New Hampshire	0	0	3	15	0	0	0	0
Vermont	0	0	4	4	0	2	0	0
Massachusetts	0	0	226	289	0	0	0	7
Rhode Island	0	0	13	19	0	0	0	1
Connecticut	1	3	56	52	0	0	2	1
Middle Atlantic States:								
New York	1	7	321	541	0	0	14	12
New Jersey	1	0	82	158	0	0	4	3
Pennsylvania	1	0	236	368	0	0	27	10
East North Central States:								
Ohio	2	1	162	77	4	15	15	18
Indiana	0	0	33	24	1	2	13	5
Illinois	3	1	178	173	2	15	20	18
Michigan	0	2	183	402	2	5	4	5
Wisconsin	0	2	59	40	20	0	4	2
West North Central States:								
Minnesota	2	3	34	31	1	1	1	0
Iowa [2]	1	0	6	13	2	15	3	5
Missouri	0	0	27	21	1	0	12	10
North Dakota	1	0	3	11	1	2	0	3
South Dakota	1	1	7	4	0	0	2	0
Nebraska	0	0	5	8	4	11	0	0
Kansas	1	2	21	13	2	11	4	7
South Atlantic States:								
Delaware	0	0	0	4	0	0	0	0
Maryland [2 3 4]	0	0	40	38	0	0	8	10
District of Columbia	0	1	7	5	0	0	1	1
Virginia [2]	1		21		0		40	
West Virginia	0	0	13	11	5	1	9	20
North Carolina [4]	1	1	10	14	0	4	37	35
South Carolina	1	2	4	1	0	0	32	44
Georgia [4]	0	0	6	3	0	1	55	41
Florida	0	0	3	1	1	4	1	5

See footnotes at end of the table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 24, 1933, and June 25, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 24, 1933	Week ended June 25, 1932	Week ended June 24, 1933	Week ended June 25, 1932	Week ended June 24, 1933	Week ended June 25, 1932	Week ended June 24, 1933	Week ended June 25, 1932
East South Central States:								
Kentucky	0	0	16	25	0	5	38	48
Tennessee	0	1	6	19	1	2	48	67
Alabama [4]	0	0	7	10	0	23	13	18
Mississippi	0	1	8	7	1	4	20	35
West South Central States:								
Arkansas	1	0	1	2	0	2	22	25
Louisiana	1	0	10	14	0	1	29	24
Oklahoma [5]	0	2	9	10	0	18	20	16
Texas [2]	1	4	41	11	64	7	56	25
Mountain States:								
Montana [2]	0	0	9	3	1	8	3	0
Idaho [2]	0	0	2	1	0	1	2	0
Wyoming [2]	0	0	11	6	0	0	1	1
Colorado [2]	0	0	8	20	0	0	0	3
New Mexico	0	0	14	2	1	0	2	5
Arizona	0	0	8	2	0	0	0	13
Utah [3]	1	0	6	2	0	0	0	1
Pacific States:								
Washington	0	3	22	15	6	2	3	2
Oregon [2]	0	0	10	13	19	2	4	2
California [2]	4	5	113	75	12	37	9	9
	26	42	2,071	2,590	151	201	582	557

[1] New York City only.
[2] Rocky Mountain spotted fever, week ended June 24, 1933, 44 cases as follows: Iowa, 2; Maryland, 5; District of Columbia, 1; Virginia, 1; Texas, 8; Montana, 4; Idaho, 4; Wyoming, 10; Colorado, 2; Oregon, 3; California, 4.
[3] Week ended Friday.
[4] Typhus fever, week ended June 24, 1933, 29 cases as follows: Maryland, 2; North Carolina, 1; Georgia, 13; Alabama, 13.
[5] Exclusive of Oklahoma City and Tulsa and for 1932 are exclusive of Tulsa only.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
April 1933										
Mississippi		14	2,041	1,895	1,625	438	0	27	6	14
May 1933										
Alabama	3	25	66	76	431	55	1	33	23	22
Georgia	2	18	187	182	572	69	0	21	1	45
Idaho			4		74		0	7	28	1
Illinois	73	104	92	3	3,703		4	1,798	28	64
Indiana	10	65	94		1,173		9	431	4	29
Kansas	6	29	3		1,219	1	2	153	6	8
Louisiana	1	41	60	32	150	50	1	32	5	59
Maryland	2	24	24		168	2	0	434	0	18
Michigan	14	94	26	6	3,817		5	2,001	0	12
Minnesota	5	23	7		3,115		0	429	1	6
Montana	1	6	22		172		0	53	1	10
North Carolina	1	52	46		2,885	118	3	184	12	44
Oregon		4	115	1	287		2	104	52	7
Rhode Island	1	9	4		8		0	153	0	1
West Virginia	1	25	10		369		1	74	1	21

April 1933

	Cases
Mississippi:	
Chicken pox	412
Dengue	5
Dysentery (amebic)	110
Hookworm disease	472
Mumps	268
Ophthalmia neonatorum	7
Puerperal septicemia	13
Rabies in animals	2
Trachoma	3
Undulant fever	1
Whooping cough	1,178

May 1933

	Cases
Chicken pox:	
Alabama	68
Georgia	178
Idaho	26
Illinois	1,967
Indiana	460
Kansas	323
Louisiana	26
Maryland	653
Michigan	1,427
Minnesota	387
Montana	147
North Carolina	444
Oregon	164
Rhode Island	223
West Virginia	130
Conjunctivitis:	
Maryland	1
Dysentery:	
Georgia	50
Illinois (amebic)	2
Illinois (bacillary)	13
Maryland	5
Oregon	1
Favus:	
Oregon	1
Food poisoning:	
Montana	1
German measles:	
Illinois	343
Kansas	380
Maryland	23
Michigan	6,479
North Carolina	52
Hookworm disease:	
Georgia	136
Louisiana	11
Impetigo contagiosa:	
Kansas	2
Maryland	3
Montana	4
Oregon	27
Lead poisoning:	
Illinois	1
Leprosy:	
Louisiana	4
Minnesota	1
Lethargic encephalitis:	
Alabama	5
Georgia	1
Illinois	3
Kansas	5
Maryland	1
Michigan	2
Minnesota	1
Mumps:	
Alabama	166
Georgia	150
Idaho	5
Illinois	926
Indiana	169
Kansas	386
Louisiana	3
Maryland	589
Michigan	1,342
Montana	7
Oregon	8
Rhode Island	79
West Virginia	1
Ophthalmia neonatorum:	
Alabama	1
Illinois	8
Minnesota	1
Paratyphoid fever:	
Georgia	1
Illinois	3
Kansas	1
Michigan	2
Puerperal septicemia:	
Illinois	2
Rabies in animals:	
Illinois	27
Indiana	42
Louisiana	4
Maryland	1
Minnesota	1
North Carolina	1
Rocky Mountain spotted fever:	
Idaho	20
Maryland	1
Minnesota	1
Montana	23
Oregon	10
Scabies:	
Maryland	6
Montana	1
Oregon	24
Septic sore throat:	
Georgia	15
Illinois	20
Kansas	5
Louisiana	2
Michigan	50
Montana	11
North Carolina	5
Oregon	5
Rhode Island	1
Tetanus:	
Alabama	2
Georgia	3
Illinois	9
Kansas	4
Louisiana	4
Maryland	2
Tick paralysis:	
Montana	3
Trachoma:	
Alabama	1
Illinois	20
North Carolina	3
Tularaemia:	
Georgia	5
Kansas	4
Louisiana	5
Montana	5
North Carolina	1
Typhus fever:	
Alabama	35
Georgia	15
Illinois	1
Maryland	1
North Carolina	1
Undulant fever:	
Georgia	2
Idaho	1
Illinois	10
Kansas	12
Louisiana	3
Maryland	3
Michigan	8
Minnesota	5
Montana	3
North Carolina	1
Oregon	1
Vincent's angina:	
Illinois	47
Kansas	6
Maryland	5
Oregon	9
Whooping cough:	
Alabama	225
Georgia	251
Idaho	2
Illinois	392
Indiana	91
Kansas	308
Louisiana	66
Maryland	200
Michigan	987
Minnesota	760
Montana	18
North Carolina	842
Oregon	54
Rhode Island	141
West Virginia	78

WEEKLY REPORTS FROM CITIES

City reports for week ended June 17, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0		0	0	1	5	0	0	0	2	14
New Hampshire:											
Concord	0		0	0	2	0	0	1	0	0	8
Nashua	0		0	1	0	0	0	0	0	0	
Vermont:											
Barre	0		0	12	0	0	0	2	0	2	3
Burlington	0		0	0	0	0	0	0	0	0	6
Massachusetts:											
Boston	6		0	224	19	53	0	13	0	41	223
Fall River	0		0	1	0	2	0	0	0	3	28
Springfield	0		0	3	0	4	0	3	0	6	22
Worcester	0		0	61	2	6	0	1	0	2	51
Rhode Island:											
Pawtucket	0		0	0	0	0	0	0	0	8	18
Providence	1		1	0	2	12	0	1	0	9	55
Connecticut:											
Bridgeport	0		0	22	2	15	0	1	0	1	21
Hartford	0		0	4	4	4	0	1	0	0	51
New Haven	0		0	2	2	0	0	2	0	15	38
New York:											
Buffalo	21		1	68	13	33	0	5	0	24	128
New York	36	5	6	573	106	71	0	104	7	107	1,431
Rochester	0		0	2	3	13	0	0	3	7	59
Syracuse	0		0	0	2	1	0	2	0	10	44
New Jersey:											
Camden	0		0	5	2	7	0	3	1	0	38
Newark	0		1	52	9	10	0	7	0	46	92
Trenton	1		0	16	2	3	0	3	0	1	30
Pennsylvania:											
Philadelphia	3	3	2	347	17	52	0	23	2	6	490
Pittsburgh	6		1	4	6	22	0	4	0	45	119
Reading	0		0	4	2	1	0	1	0	5	31
Ohio:											
Cincinnati	3		1	12	5	10	0	7	2	23	130
Cleveland	6	27	1	4	7	53	0	16	1	28	172
Columbus	3	1	1	1	3	18	0	1	0	0	88
Toledo	0		0	83	2	65	0	2	0	11	68
Indiana:											
Fort Wayne	2		0	0	2	3	0	1	0	0	28
Indianapolis	0		0	80	6	3	1	2	0	14	
South Bend	0		0	1	1	1	0	0	0	0	17
Terre Haute	1		0	17	1	5	0	1	0	0	14
Illinois:											
Chicago	2		1	235	25	135	0	48	1	31	623
Springfield	1		0	1	0	3	0	0	0	7	12
Michigan:											
Detroit	21		1	140	6	37	0	21	0	157	227
Flint	0	2	0	2	2	5	0	1	0	6	20
Grand Rapids	0		0	1	2	5	0	2	1	2	35
Wisconsin:											
Kenosha	0		0	0	0	1	0	0	0	12	5
Madison	0			15		1	0		0	5	
Milwaukee	0		0	6	2	22	0	2	0	72	92
Racine	0		0	0	0	4	0	0	0	20	11
Superior	0		0	0	1	0	0	0	0	3	10
Minnesota:											
Duluth	0		1	26	1	0	0	0	0	34	14
Minneapolis	6		0	10	3	19	0	2	0	18	95
St. Paul	0		0	22	3	10	0	0	0	85	41
Iowa:											
Des Moines	1			2		2	0		0	1	29
Sioux City	1			1		3	0		0	0	
Waterloo											
Missouri:											
Kansas City	1		0	4	7	12	0	11	0	7	106
St. Joseph	0		0	7	5	0	0	0	0	1	33
St. Louis	15			117	3	4	0	8	5	4	199
North Dakota:											
Fargo	0		0	0	0	0	0	0	0	7	3
Grand Forks	0		0	0	0	0	0	0	0	0	
South Dakota:											
Aberdeen	0		0	0	0	0	0	0	0	0	

City reports for week ended June 17, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Nebraska:											
Omaha	1	------	0	35	4	3	2	0	0	5	------
Kansas:											
Topeka	1	------	0	20	2	1	0	0	0	0	22
Wichita	0	------	0	0	1	0	0	1	0	7	------
Delaware:											
Wilmington	0	------	0	12	0	0	0	1	0	1	31
Maryland:											
Baltimore	3	2	2	3	10	32	0	12	0	47	195
Cumberland	0	------	0	0	1	2	0	1	0	0	10
Frederick	0	------	0	0	0	2	0	0	0	0	4
District of Col.:											
Washington	1	------	0	21	13	4	0	12	0	4	141
Virginia:											
Lynchburg	0	------	0	27	1	3	0	0	0	24	9
Norfolk	0	------	0	2	1	2	0	2	0	2	22
Richmond	1	------	0	2	2	1	0	1	1	13	41
Roanoke	0	------	0	12	0	1	0	1	0	0	11
West Virginia:											
Charleston	0	------	0	0	0	1	0	0	2	0	17
Huntington	1	------	0	0	0	0	0	0	0	0	------
Wheeling	0	------	0	0	1	1	0	0	0	24	13
North Carolina:											
Raleigh	0	------	0	0	0	0	0	0	0	0	10
Wilmington	0	------	0	8	0	0	0	1	0	0	11
Winston-Salem	0	------	0	0	0	2	0	3	0	5	17
South Carolina:											
Charleston	0	5	0	0	1	0	0	0	2	17	20
Columbia	0	------	0	0	0	0	0	0	0	0	------
Greenville	0	------	0	1	0	0	0	0	0	1	11
Georgia:											
Atlanta	2	14	1	14	3	0	0	5	5	24	74
Brunswick	0	------	0	0	0	0	0	0	0	0	1
Savannah	1	4	0	0	2	1	0	3	1	6	29
Florida:											
Miami	0	------	0	0	0	0	0	1	0	1	21
Tampa	0	1	1	0	0	0	0	1	1	0	18
Kentucky:											
Ashland	0	------	0	1	0	0	0	0	0	1	------
Lexington	0	------	0	0	0	0	0	0	0	0	9
Louisville	0	------	0	3	6	5	0	4	2	3	83
Tennessee:											
Memphis	0	------	1	107	3	0	0	5	4	36	72
Nashville	0	------	1	9	1	0	0	1	0	8	46
Alabama:											
Birmingham	0	1	0	0	5	2	0	3	3	4	56
Mobile	1	------	0	0	1	0	0	0	0	0	24
Montgomery	0	------	------	0	------	0	0	------	0	0	------
Arkansas:											
Fort Smith	------	------	------	------	------	------	------	------	------	------	------
Little Rock	0	------	1	19	3	0	0	0	1	0	6
Louisiana:											
New Orleans	5	------	0	0	3	4	0	9	1	3	121
Shreveport	0	------	0	0	1	0	0	1	1	0	26
Oklahoma:											
Tulsa	0	------	------	16	------	1	1	------	1	5	------
Texas:											
Dallas	3	------	0	3	2	2	0	0	0	7	43
Fort Worth	0	------	0	0	2	1	0	2	0	0	37
Galveston	0	------	0	0	1	0	0	2	------	------	14
Houston	1	------	1	2	2	------	------	7	2	1	69
San Antonio	1	------	0	3	1	0	0	2	0	0	40
Montana:											
Billings	0	------	0	0	0	0	0	0	0	1	7
Great Falls	0	------	0	0	2	0	0	0	0	3	12
Helena	0	------	0	0	0	0	0	0	0	0	1
Missoula	0	------	0	0	0	1	0	1	0	0	11
Idaho:											
Boise	0	------	0	0	0	0	1	1	0	0	7
Colorado:											
Denver	0	19	1	1	5	11	0	2	0	7	49
Pueblo	0	------	0	0	0	0	0	0	0	0	8
New Mexico:											
Albuquerque	5	------	0	0	2	2	0	2	0	5	9
Utah:											
Salt Lake City	0	------	0	57	1	2	0	3	0	23	35

City reports for week ended June 17, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Nevada:											
Reno	0		0	0	0	0	0	0	0	0	2
Washington:											
Seattle	1			2		13	0		0	9	
Spokane	0			30		0	0		0	0	
Tacoma	0		0	1	1	1	0	0	0	0	38
Oregon:											
Portland	2		0	3	4	4	15	2	0	2	67
Salem	0	2		2		0	0		0	0	
California:											
Los Angeles	21	6	1	200	9	59	12	24	0	65	274
Sacramento	1	1	1	1	1	2	0	3	0	46	25
San Francisco	0	2	3	2	10	5	0	7	1	26	148

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts:			
Boston	1	0	0
New York:			
New York	1	1	2
New Jersey:			
Newark	1	0	0
Indiana:			
Indianapolis	1	0	0
Illinois:			
Chicago	2	1	0
Wisconsin:			
Milwaukee	1	1	0
Minnesota:			
Minneapolis	0	1	0
North Carolina:			
Raleigh	0	1	0
Tennessee:			
Memphis	0	1	0
Louisiana:			
New Orleans	1	0	1
California:			
Los Angeles	1	1	0
San Francisco	0	1	0

Lethargic encephalitis.—Cases: New York, 2; Camden, 1; Chicago, 1.

Pellagra.—Cases: Worcester, 1; Cleveland, 1; Chicago, 1; 1; Winston-Salem, 2; Charleston, S.C., 3; Savannah, 3; Montgomery, 1; New Orleans, 1.

Rabies (in man).—1 death at Louisville.

Typhus fever.—Cases: New York, 1; Savannah, 3; Tampa, 1; Montgomery, 1.

FOREIGN AND INSULAR

CZECHOSLOVAKIA

Communicable diseases—April 1933.—During the month of April 1933 certain communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	1		Paratyphoid fever	6	
Cerebrospinal meningitis	14	5	Poliomyelitis	8	1
Chicken pox	251		Puerperal fever	50	19
Diphtheria	2,153	109	Scarlet fever	1,699	13
Dysentery	6		Trachoma	162	
Influenza	124	18	Typhoid fever	303	31
Lethargic encephalitis	1	1	Typhus fever	32	1

PUERTO RICO

Notifiable diseases—Four weeks ended May 20, 1933.—During the 4 weeks ended May 20, 1933, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chicken pox	150	Ophthalmia neonatorum	3
Diphtheria	33	Pellagra	14
Dysentery	235	Puerperal fever	3
Erysipelas	5	Syphilis	10
Filariasis	4	Tetanus	5
Influenza	130	Tetanus, infantile	3
Leprosy	1	Trachoma	5
Malaria	1,887	Tuberculosis	426
Measles	264	Typhoid fever	33
Mumps	41	Whooping cough	160

VIRGIN ISLANDS

Notifiable diseases—February, March, and April 1933.—During the months of February, March, and April 1933 cases of certain notifiable diseases were reported in the Virgin Islands as follows:

Disease	Cases			Disease	Cases		
	February 1933	March 1933	April 1933		February 1933	March 1933	April 1933
Chicken pox	3	3		Pellagra	1	2	2
Filariasis	53	6	18	Sprue			1
Fish poisoning	1			Syphilis	13	17	10
Gonorrhea	3	1	3	Tuberculosis	2		1
Malaria	65	37	11	Uncinariasis		1	1
Measles	42	378	16	Whooping cough	29	22	8

YUGOSLAVIA

Communicable diseases—May 1933.—During the month of May 1933 certain communicable diseases were reported in Yugoslavia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	28	5	Poliomyelitis	2	1
Cerebrospinal meningitis	14	1	Scarlet fever	216	12
Diphtheria and croup	496	42	Sepsis	6	1
Dysentery	40	1	Tetanus	41	14
Erysipelas	141	3	Typhoid fever	158	16
Measles	836	15	Typhus fever	62	7
Paratyphoid fever	7				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for June 30, 1933, pp. 776-786. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued July 28, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Philippine Islands.—During the week ended June 24, 1933, cholera was reported in the Philippine Islands as follows: Province of Bohol, 13 cases, 2 deaths; Province of Cebu, Cebu city, 1 case, 1 death; Province of Occidental Negros, 19 cases, 9 deaths; Province of Samar, 4 cases, 2 deaths.

Plague

Ceylon.—During the week ended June 17, 1933, 1 case of plague with 1 death was reported in Colombo, Ceylon.

Syria.—During the week ended June 17, 1933, 1 case of plague was reported in Beirut, Syria.

Yellow Fever

Brazil.—During the week ended February 25, 1933, 2 cases of yellow fever with 2 deaths were reported in Anaripe, Ceara State, Brazil. During June, 1933, 1 case of yellow fever with 1 death was reported in Novo Exu, Pernambuco State, Brazil.

Gold Coast.—Under date of June 21, 1933, 1 case of yellow fever was reported in Amanful, Winnebaga District, Gold Coast.

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Deaths in Large Cities During the Week Ended June 24
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Quarantinable and other Diseases in Foreign Countries

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HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

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They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States in so far as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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AN OUTBREAK OF DERMATITIS AMONG WORKERS IN A RUBBER MANUFACTURING PLANT

By LOUIS SCHWARTZ, *Senior Surgeon, United States Public Health Service*, and LOUIS TULIPAN, M.D., New York, N.Y.

In a plant employing about 150 workers, engaged in the manufacture of sheet rubber goods, there occurred an outbreak of dermatitis beginning in the early part of September 1932 and continuing into October 1932. Altogether, eight workers were affected.

The first man to become affected was a carpenter and general-utility man. He was 67 years old, and had been employed in the plant at the same occupation for 10 years and had never before had any skin disease. In part his duties were to carry hot rubber strips from the mill, to place them on a table, and then separate them. These rubber strips were carried over his bare arm. He used gloves on his hands.

Following a severe contusion of the right elbow, with skin unbroken (Sept. 6, 1932), on which he applied an unknown solution to bring down the swelling, a dermatitis developed on the right arm and hand. The patient applied no more solution but continued to work. The condition became steadily worse and a few days afterward spread to the left arm and hand. The condition then became so severe that he stopped work for 1 week, during which time the arms and hands so improved that he could resume work. But as soon as he did so the dermatitis again returned and spread to his neck as well. At this time he sought the advice of a physician. He presented a pin-point to pin-head papulo-vesicular eruption with crusting and fissuring of the skin and serous oozing of the hands and forearms, with some patches on the upper arms, chest, and upper part of the back.

Upon being questioned, he stated that he had used some sulphur soap on the inflamed parts and this, no doubt, tended to aggravate the condition. He was given calamine lotion and stopped working until he recovered. Upon his return to work, however, the eruption again reappeared. He was again kept at home, under a mild anti-pruritic lotion, to await the disappearance of the eruption. At the time of this report he had a dry, scaling eczematous condition of the hands and forearms accompanied with itching.

Another case developed in a man who was employed on a milling machine, mixing compounds into the rubber. He was 59 years old, had worked in the plant for 12 years, and never had any eruption before the present one. On September 24, 1932, he noticed a rash after handling hot rubber, which, upon examination, presented an erythematous papulo-vesicular eruption with scratch marks, some grouping, and fine scales on both forearms from the wrists to the elbows. He stated that he used gloves while working.

Six other cases occurred in workers at the plant, all of whom had worked there for a number of years and had never had eruptions before, except one man employed as a vulcanizer, using the vapor cure method, in which sulphur dichloride (SCl_2) is used and neutralized with ammonia (NH_3). On the fingers and hands were some superficial caustic burns, which he stated that he got from time to time from the irritating sulphur dichloride and ammonia.

The other five cases occurred among the mill men and callender men. (Mill men are men who work on roll mills which mix the rubber with the compounds, and callender men are men who work on roller machines which spread the rubber into thin sheets.)

Out of a total of 8 mill men employed, 4 developed dermatitis, and of the 2 callender men employed, both developed dermatitis.

REPORT ON INVESTIGATION

The plant is a small one, modernly equipped. No medical service is maintained, as the plant is located in the center of a large city and medical service is immediately available in the neighborhood.

An inspection was made of all the workers for the occurrence of dermatitis. During this inspection 75 women and 44 men were examined. Of the women, 68 were between 20 and 34 years of age, and 7 were between 35 and 59 years of age. Of the men, 27 were between 20 and 34 years of age, 15 between 35 and 59 years of age, and 2 over 60 years of age.

All the women except 3 had worked in the plant for more than 1 year, and all the men except 3 had worked in the plant for more than 2 years.

No cases of dermatitis were found among the women, nor were any found among the men working in the plant outside of the occupations of milling and the callender machines, except the small alkali burns on the hands of the vapor curer previously mentioned.

According to the superintendent, no other cases of dermatitis had occurred in this plant during the more than 20 years of its existence.

PROCESS

Crepe rubber is used in the plant and it is milled with lithopone, whiting, magnesium carbonate, and zinc oxide. Coumarin ($C_9H_6O_2$)

a vanilla substitute, had been used in small quantities for the 4 months preceding the investigation as a compound to cover up the rubber odor.

After being milled, the rubber is rolled into thin sheets, which are cut in suitable designs and vapor cured with sulphur dichloride and neutralized with ammonia. Starch is used throughout the plant to keep the rubber from sticking. No accelerators or anti-oxidants are used in this process.

Previous experience had shown that crepe rubber, lithopone, magnesium carbonate, and zinc oxide are rarely, if ever, implicated as the causes of industrial dermatitis. We thought that perhaps the Coumarin might have been the exciting cause, since it had only been in use for about 4 months and was contained in all the stock made by the company, and because cases of vanilla dermatitis (*1*) have been reported.

Therefore, on each of five of the workers who still had an eruption, two patches were placed. One patch contained a 2-percent alcoholic solution of Coumarin and the other, the raw rubber stock, containing lithopone, whiting, magnesium carbonate, zinc oxide, and Coumarin. Patches were not placed on the vapor curer and two men whose eruptions had, by that time, disappeared. The patches were placed on the arms and left on for 24 hours. At the end of that time they were removed, but there was no reaction under any of them.

Further inquiry brought out the fact that, since the latter part of July, the company had been experimenting with the manufacture of rubber-stamp material, and that in this process accelerators and anti-oxidants were used. Only a small amount of this material had been manufactured up to the date of the outbreak of the dermatitis. The rubber for this purpose was compounded with tetramethylthiuram disulphide and benzothiazyl disulphide, which are accelerators, as well as with another accelerator which is a form of elementary selenium. An antioxidant, Sym. di-beta-napthyl-paraphenylenediamine, was also used.

After this mixture had been milled, it was carried by hand to the callender machines and there rolled into sheets of suitable thickness, to be sold, unvulcanized, to the printers' trade.

All of the men affected with the dermatitis, except the vapor curer, had come in contact with the new product. Consequently, it was determined to "patch" the five men with these chemicals.

DESCRIPTION OF THE CHEMICALS

(NOTE.—This description is taken from the booklet of the firm which manufactures and sells these chemicals. Trade names are not used in the description.)

Accelerator "A" consists essentially of tetramethylthiuram disulphide, $(CH_3)_2N.C(S).S.S.C.(S).N(CH_3)_2$. It is made by oxidizing the addition product of dimethylamine and carbon disulphide. It is

a grayish-white powder, insoluble in water, aqueous acids, or alkalies, and gasoline. It is moderately soluble in alcohols, acetone, ether, and benzol, and freely soluble in chloroform, ethylene dichloride and tetrachlorethane. It has a specific gravity of 1.29 and a melting point of 140–145° C. It is odorless and nondiscoloring.

Accelerator "B" consists essentially of benzothiazyl disulphide, $C_6H_4N{:}C(S).S.S.C(S){:}N.C_6H_4$. It is a light-yellow powder insoluble in water, aqueous alkalies, and gasoline; soluble in alcohols, acetone, ether, benzol, chloroform, ethylene dichloride, and tetrachlorethane. It has a specific gravity of 1.50 and a melting point of about 176° C.

Accelerator "C" is a form of elementary selenium. It is a dark-gray powder with a specific gravity of 4.80 and a melting point of 217° C.

All these are said to be nontoxic.

ANTIOXIDANT

The antioxidant used was Sym. di-beta-napthyl-para-phenylene-diamine. It is a grayish-white powder having a specific gravity of 1.20 and a melting point between 230° and 235° C. It is insoluble in water, very slightly soluble in alcohol and gasoline, and moderately soluble in benzene, acetone, and carbon disulphide.

PATCH TESTS

Five patches were applied on each man—1 patch of each of the 4 compounds and 1 containing a mixture of all the compounds. The powder was put on a moistened piece of gauze, which was placed on the patient's back, covered with a layer of rubber dam, then a layer of flannel, and sealed with an adhesive patch. The patches were left on for 24 hours. The results were as follows:

The carpenter and general-utility man showed a + reaction to Accelerator "A" and a + reaction to the antioxidant. The patch containing the mixture of chemicals fell off soon after it was put on.

One mill man showed a + reaction to Accelerator "A" and a + reaction to the mixture of all the compounds.

One callender worker showed a + reaction to Accelerator "A" and a + reaction to the mixture of all compounds, and the other callender man showed + reactions under all five patches.

The fifth man "patched", a mill man, showed no reaction under any of the patches. This man had only a very mild eruption, consisting of a few vesicles on the right elbow which had disappeared after a few days and were not present at the time that he was patched with the accelerators and antioxidant.

DISCUSSION

This company, which had been in existence over 20 years, and engaged in the manufacture of a rubber product without the use of

accelerators or antioxidants, and in vapor curing, had never known of dermatitis occurring among its employees previous to the present outbreak.

About 2 weeks after it began the manufacture of a new rubber product containing three accelerators and an antioxidant, there developed an outbreak of dermatitis among the men handling this new product. None of the employees who did not handle this product developed dermatitis.

Patch tests on 5 of those who had the dermatitis at the time the investigation was begun showed that 4 of them were sensitive to Accelerator "A" and one was also sensitive to the antioxidant used. One was sensitive to all the accelerators and to the antioxidant. The one man who showed no reaction under the patches was entirely cured of his eruption at the time when the patches of accelerators and antioxidant were applied.

Patch tests with Coumarin were negative in all cases.

From these facts it seems reasonable to deduce that the outbreak of dermatitis in this plant was mostly due to hypersensitivity of the affected men to the accelerators and the antioxidant, especially to Accelerator "A." This accelerator has been implicated before as the cause of dermatitis (*2*).

All cases except one, the carpenter and general utility man, had fully recovered and were at work at the time when this report was written (November 1932). They have either developed an immunity against the chemicals or the onset of cooler weather may have stopped the action of the chemicals on the skin. The fact that one of the mill men showed no reaction to the patch test shows that he is now immune.

It has been noted in other cases of occupational dermatitis that continued exposure will, in some cases, cause an immunity that lasts for a short time. In many occupations the onset of cool weather greatly lessens the number of cases of dermatitis.

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A NOTE ON THE FOOD HABITS OF COLPIDIUM

By C. T. Butterfield, *Principal Bacteriologist, Stream Pollution Investigations, United States Public Health Service*

Purdy and Butterfield (1918), in presenting their study on the effect of plankton animals upon bacterial death rates, showed that bacteria-free protozoa (Paramoecia and Colpidia) when inoculated into sterilized sewage, fail to grow, and die out in a few days. Their results indicate also that some of the protozoa (particularly *Colpidium*) will flourish in pure water containing bacterial cells as the only source of food.

Butterfield (1929b), in discussing the relation between the food concentration in liquid media and bacterial growth, suggests that there is a definite relationship between the size of the individual cell and the minimum concentration of dissolved, available food required to produce growth. His results show that *Bact. aerogenes* grows well

in media containing only 5 milligrams of food per liter, while *Colpidium*, a much larger organism, requires a concentration of at least 500 milligrams per liter to stimulate growth. However, when these two organisms are both introduced into media containing only 5 milligrams of food per liter, both flourish. As *Colpidium* does not start to grow until the bacteria have reached considerable numbers, Butterfield suggests that the bacteria act as "accumulators" or "concentrators" of the food which is too dilute to stimulate growth of the *Colpidium*.

Butterfield, Purdy, and Theriault (1931), in their study of the influence of the plankton on the biochemical oxidation of organic matter, found that *Colpidium* growing in pure bacteria-free culture in concentrated media use up oxygen, but only in relatively small amounts. From their results they conclude that the chief function of the plankton in the biochemical oxidation process is to reduce the bacterial population below the saturation point and thus to provide conditions suitable for continuous bacterial multiplication with its accompanying oxidative effect.

These findings, which have been reviewed, indicate quite clearly that *Colipidium* will not grow in dilute media in the absence of bacteria but will grow well in it when bacteria are present. In fact, this organism will grow in the absence of all other sources of food if bacteria are present in sufficient numbers. In addition, it has been observed that in dilute media *Colpidium* does not increase until the bacteria have reached appreciable numbers, and that concurrent with the increase of the *Colpidium* the bacteria decrease. These facts show definitely that *Colpidium* can depend upon bacterial cells as a sole source of food and that they utilize them when they are available.

The results thus far reported, however, do not indicate whether the dilute media, after it has been worked over and altered by the bacteria, may not then contain end products of bacterial metabolism which would serve as available food for the *Colpidium* if the bacterial cells as such were excluded. As this information concerning the suitability of the end products of bacterial metabolism as a source of food supply for *Colpidium* might be of considerable value in interpreting the results obtained and in adjusting conditions to favor the natural purification process, experimental tests have been designed and observations have been made to determine the availability of dilute media, after it has been subjected to bacterial action, as a food supply for *Colpidium*.

Dilute media, containing 5 milligrams each of dextrose and peptone per liter of distilled water, buffered at pH 7.2 with phosphate, were prepared in accordance with the directions given by Butterfield (1929a). The medium was filtered and placed in 150-cubic centimeter amounts in Pyrex Erlenmeyer flasks. After sterilization, each flask was inoculated with *Bact. aerogenes*, using the same

amount of inoculum in each case. The flasks were designated by letters A to G, inclusive, and were stored at 20° C. in the dark. Daily examinations were made to determine the bacterial content.

At the end of the third day the bacterial cells were removed from the contents of flasks A, B, C, F, and G by double filtration through Berkefeld filters, first through a filter of normal porosity (grade N) and then through a very dense filter (grade W). The filtrate, presumedly free from bacterial cells, was redistributed into sterile Pyrex Erlenmeyer flasks, similiarly marked, and all of the flasks, including D and E, whose contents were not filtered, were inoculated with the same amount of bacteria-free *Colpidium* culture. The amount of inoculum added was sufficient to produce a *Colpidium* content of about one per cubic centimeter in each instance. The samples were again incubated at a temperature of 20° C., and frequent examinations were made to determine both the bacteria and the *Colpidium* present.

After an additional incubation of 4 days, no increase in numbers of *Colpidium* having been observed in any of the flasks that were free from bacteria, flasks A, B, and C were reinoculated with *Bact. aerogenes.* No change was made in the condition of any of the other samples. Storage of all flasks at 20° C. was continued, and examinations for bacteria and *Colpidium* were made at frequent intervals. The results obtained from this series of tests are set forth in the accompanying table.

From these results it is noted that *Bact. aerogenes* grew well in this dilute media in all instances reaching an average limiting number of 6,530,000 cells per cubic centimeter in 2 days and of 7,390,000 in 3 days. This is in good agreement with the results previously obtained with this media and bacterium. The *Colpidium* did not increase in numbers in any of the flasks from which the bacteria had been removed by filtration as long as they remained bacteria-free. This was true of flasks A, B, and C for a 4-day period and of F and G for a 12-day interval. In the case of flasks D and E, where the bacteria were not removed, the *Colpidium* grew well and soon reached their usual limiting number. In flasks A, B, and C, the *Colpidium* failed to grow for 4 days in the absence of bacterial cells but did grow in a normal manner when the bacterial cells were returned. Thus Berkefeld filtration of the bacterial cultures did not introduce any inhibitory effect or remove any growth-supporting property of the media which was not restored with the restoration of the bacterial cells.

The results of this series of experiments would indicate quite definitely, therefore, that, at least under the conditions of these tests, *Colpidium* does not utilize the end products of bacterial metabolism as a source of food but rather depends upon the bacterial cells as such.

Interactivity of Bact. aerogenes and Colpidium—Growth of Colpidium in media from which Bact. aerogenes have been removed by filtration after the bacteria had been growing in the media for 3 days

Time, in days	Flask A		Flask B		Flask C		Flask D		Flask E		Flask F		Flask G	
	Bacteria per cc	Colpidium per cc	Bacteria per cc	Colpidium per cc	Bacteria per cc	Colpidium per cc	Bacteria per cc	Colpidium per cc	Bacteria per cc	Colpidium per cc	Bacteria per cc	Colpidium per cc	Bacteria per cc	Colpidium per cc
0	680	None	680	None	680	None	680	None	680	None	680	None	680	None
1	48,000	None	19,100	None	15,600	None	11,400	None	11,800	None	18,800	None	34,600	None
2	10,000,000	None	7,050,000	None	5,800,000	None	2,790,000	None	7,050,000	None	5,650,000	None	6,850,000	None
3	7,450,000	None	7,450,000	None	6,600,000	None	6,850,000	None	7,800,000	None	8,150,000	None	7,450,000	None
3 [1]	[1] None	1	[1] None	1	[1] None	1	6,850,000	1	7,800,000	1	[1] None	1	[1] None	1
4	None	<1	None	<1	None	1		2		3	None	1	None	<1
5	None		None		None						None		None	
6	None	<1	None	<1	None	<1	2,530,000	500	2,990,000	612	None	<1	None	<1
7	None	<1	None	1	None	<1	1,690,000	860	1,720,000	660	None	<1	None	1
7 [2]	[2] 145,000	<1	[2] 151,000	1	[2] 133,000	<1	1,690,000	860	1,720,000	660	None	<1	None	1
8	725,000	2	555,000	3	525,000	1	1,310,000	600	1,400,000	730	None	1	None	<1
9	2,650,000	5	1,860,000	5	1,460,000	2	805,000	900	825,000	580	None	<1	None	<1
10	2,630,000	62	2,420,000	30	2,080,000	58	475,000	590	675,000	670	None	<1	None	<1
11	1,410,000	465	1,550,000	240	1,440,000	630	322,000	630	500,000	650	None	<1	None	<1
13	455,000	600	645,000	370	475,000	370	296,000	450	495,000	410	None	<1	None	<1
15	77,500	960	263,000	790	122,000	460	171,000	260	250,000	290	None	<1	None	<1

[1] At the end of the 3-day period the contents of flasks A, B, C, F, and G, were filtered through Berkefeld N and W grade filters and the filtrate was placed in sterile flasks marked as before. All flasks, including D and E, were inoculated with bacteria-free *Colpidium* at the same time.

[2] At this time, 7 days from the start of the tests, flasks A, B, and C, were again inoculated with *Bact. aerogenes*, while the other flasks D, E, F, and G, were not altered.

REFERENCES

(1) Butterfield, C. T.: (1929a) Experimental Studies of Natural Purification in Polluted Waters. II. Development of a suitable dilute medium. Pub. Health Rep., 44 : 2647.
(2) Butterfield, C. T.: (1929b) Experimental Studies of Natural Purification in Polluted Waters. III. A note on the relation between food concentration in liquid media and bacterial growth. Pub. Health Rep., 44 : 2865.
(3) Butterfield, C. T., Purdy, W. C., and Theriault, E. J.: (1931) Experimental Studies of Natural Purification in Polluted Waters. IV. The influence of the plankton on the biochemical oxidation of organic matter. Pub. Health Rep., 46 : 393.
(4) Purdy, W. C., and Butterfield, C. T.: (1918) The Effect of Plankton Animals upon Bacterial Death Rates. Am. Jour. Pub. Health, 8 : 499.

WHOLE-TIME COUNTY HEALTH OFFICERS, 1933

This directory has been compiled from data furnished as of January 1, 1933, by State health officers. Similar directories for the years 1922 to 1931, inclusive, have been published in the Public Health Reports. The directory for 1931 was issued as Reprint No. 1523.

In the questionnaire sent out for the purpose of obtaining the necessary information, a "whole-time" county health officer was defined as "one who does not engage in the practice of medicine or in any other business but devotes all his time to official duties."

Directories of State health departments have been published annually by the Public Health Service for the years 1912 to 1931, inclusive. The directory for 1931 was issued as Reprint No. 1522 from the Public Health Reports.

Directories of city health officers have been published annually for the years 1916 to 1931, inclusive, the directory for 1931 being Reprint No. 1521.

(Owing to lack of available funds for printing requirements, none of these directories was printed for 1932.)

State and county	Name of health officer	Post-office address	Official title
Alabama:			
Baldwin	J. Chason, M.D.	Bay Minette	County health officer.
Barbour	E. M. Moore, M.D.	Clayton	Do.
Blount	C. V. Hendrix, M.D.	Oneonta	Do.
Bullock	J. E. McClellan, M.D.	Union Springs	Do.
Calhoun	G. A. Cryer, M.D.	Anniston	Do.
Chambers	C. S. Cotlin, Jr., M.D.	Lafayette	Do.
Cherokee	S. C. Tatum, M.D.	Center	Do.
Choctaw	W. G. Carnathan, M.D.	Butler	Do.
Clarke	R. D. Neal, M.D.	Grove Hill	Do.
Cleburne	F. R. Wood, M.D.	Heflin	Do.
Coffee	W. A. Stanley, M.D.	Enterprise	Do.
Colbert	W. T. Burkett, M.D.	Tuscumbia	Do.
Conecuh	E. L. Kelly, M.D.	Evergreen	Do.
Covington	F. H. Boyd, M.D.	Andalusia	Do.
Crenshaw	J. O. Foster, M.D.	Luverne	Do.
Cullman	M. S. Whiteside, M.D.	Cullman	Do.
Dale	W. L. Orr, M.D.	Ozark	Do.

State and county	Name of health officer	Post-office address	Official title
Alabama—Continued			
Dallas	L. T. Lee, M.D	Selma	County health officer.
De Kalb	Lee Weathington, M.D	Fort Payne	Do.
Elmore	W S. Owsley, M.D	Wetumpka	Do.
Escambia	George T. Rowe, M D	Brewton	Do.
Etowah	C. L Murphree, M.D	Gadsden	Do.
Franklin	N. P. Underwood, M.D	Russellville	Do.
Geneva	L. S. Nichols, M.D	Geneva	Do.
Houston	F. G. Granger, M.D	Dothan	Do.
Jackson	Lucian Newman, M.D	Scottsboro	Do.
Jefferson	J. D. Dowling, M.D	Birmingham	Do.
Lauderdale	W. D. Hubbard, M.D	Florence	Do.
Lawrence	R. E. Harper, M.D	Moulton	Do.
Lee	A. H. Graham, M.D	Opelika	Do.
Limestone	W. J. Donald, M.D	Athens	Do.
Lowndes	E. F. Leatherwood, M.D	Hayneville	Do.
Macon	Murray Smith, M.D	Tuskegee	Do.
Madison	W. C. Hatchett, M.D	Huntsville	Do.
Marengo	E. T. Norman, M.D	Linden	Do.
Marion	L. L. Parks, M.D	Hamilton	Do.
Marshall	H. H. Awtrey, M.D	Guntersville	Do.
Mobile	C. A. Mohr, M.D	Mobile	Do.
Monroe	T. E. Tucker, M D	Monroeville	Do.
Montgomery	J. L. Bowman, M.D	Montgomery	Do.
Morgan	H. C. McRee, M.D	Decatur	Do.
Perry	J. R. Long, M.D	Marion	Do.
Pickens	J. L. Conyers, M D	Carrollton	Do.
Pike	W. H. Abernethy, M.D	Troy	Do.
Shelby	J. M Kimmey, M.D	Columbiana	Do.
Sumter	J. S Hough, M.D	Livingston	Do.
Talladega	J. H. Hill, M.D	Talladega	Do.
Tallapoosa	C. C. Fargason, M.D	Dadeville	Do.
Tuscaloosa	A. A Kirk, M.D	Tuscaloosa	Do.
Walker	A. M. Waldrop, M.D	Jasper	Do.
Washington	I. C. Sumner, M.D	Chatom	Do.
Wilcox	E. L. McIntosh, M.D	Camden	Do.
Arizona:			
Cochise	R. B. Durfee, M.D	Bisbee	Director.
Gila	A. C. McKean, M.D	Globe	Do.
Maricopa	A. N. Crain, M.D	Phoenix	Do.
Pima	Lewis H. Howard, M.D	Tucson	Do.
Arkansas:			
Ashley	A. M. Gibbs, M.D	Hamburg	County health officer.
Clark	T. T. Ross, M.D	Arkadelphia	Director county health unit.
Conway	W. H. Bruce, M.D	Morrilton	County and city health officer.
Crittenden	B. M. Stevenson, M.D	Marion	County health officer.
Cross	J. D. McKie, M.D	Wynne	Do.
Garland	J. F. Merritt, M.D	Hot Springs	Do.
Jackson	M. B. Owens, M.D	Newport	Do.
Jefferson	George A. Hays, M D	Pine Bluff	Do.
Little River	J. W. Ringgold, M.D	Ashdown	Do.
Lonoke - Prairie - Arkansas.[1]	F. A. Corn, Jr., M.D	Lonoke	Director of district.
Mississippi	A. M. Washburn, M.D	Blytheville	County health officer.
Monroe	C. A. Henry, M D	Clarendon	Do.
Ouachita	R. C. Kennerly, M.D	Camden	Do.
Phillips	W. B. Bruce, M.D	Helena	Do.
Pope	A. B. Tate, M.D	Russellville	Do.
Pulaski	J. A. Summers, M.D	Little Rock	Do.
Saline	T. C. Watson, M.D	Benton	Do.
Sebastian	J. E. Johnson, M.D	Fort Smith	Do.
Woodruff	J. F. Hays, M.D	Augusta	Do.
Yell	T. J. Pool, M.D	Ola	Do.
California:			
Contra Costa	W. A. Powell, M.D	Martinez	Do.
Imperial	Warren F. Fox, M.D	El Centro	Do.
Los Angeles	John L. Pomeroy, M.D	Los Angeles	Do.
Madera	Lee A. Stone, M.D	Madera	Do.
Monterey	Roy M. Fortier, M.D	Salinas	Do.
Orange	K. H. Sutherland, M.D	Santa Ana	Do.
Riverside	W. B. Wells, M.D	Riverside	Do.
San Bernardino	E. B. Godfrey, M.D	San Bernardino	Do.
San Diego	Alex M. Lesem, M.D	San Diego	Do.
San Joaquin	John J. Sippy, M.D	Stockton	Do.
San Luis Obispo	Allen F. Gillihan, M.D	San Luis Obispo	Do.
Santa Barbara	R C. Main, M.D	Santa Barbara	Do.
Stanislaus	E. F. Reamer, M.D	Modesto	Do.
Yolo	Fred R. Fairchild, M.D	Woodland	Do.
Connecticut:			
Fairfield	Lawrence E. Poole, M.D	Fairfield	Health officer.
Hartford	Theodore F. Foster, M.D., M.P.H.	West Hartford	Superintendent of health.

[1] Tricounty project.

State and county	Name of health officer	Post-office address	Official title
Delaware:			
Kent	E. F. Smith, M D	Dover	County unit officer.
New Castle	J. R. Downes, M D	Newark	Do.
Sussex	J. B. Derrickson, M.D.	Georgetown	Do.
Florida:			
Escambia	W. A. McPhaul, M.D	Pensacola	County health officer.
Leon	L. J. Graves, M.D	Tallahassee	Do.
Taylor	Walton H. Y. Smith, M.D	Perry	Do.
Georgia			
Baldwin	O. F. Moran, M.D	Milledgeville	Commissioner of health.
Bartow	A. C. Shamblin, M.D	Cartersville	Do.
Bibb	J. D. Applewhite, M.D	Macon	Do.
Brooks	O. L. Von Canon, M.D	Quitman	Do.
Chatham	V. H. Bassett, M.D	Savannah	Do.
Clarke	W. W Browne, M.D	Athens	Do.
Cobb	J. E. Lester, M.D	Marietta	Do.
Colquitt	T. H. Chesnutt, M.D	Moultrie	Do.
Decatur	M. A. Fort, M.D	Bainbridge	Do.
De Kalb	J. R. Evans, M.D	Decatur	Do.
Dougherty	Hugo Robinson, M.D	Albany	Do.
Floyd	B. V. Elmore, M.D	Rome	Do.
Fulton	Wm. N. Adkins, M.D	Atlanta	Do.
Glynn	H. L. Akridge, M.D	Brunswick	Do.
Grady	J. R. Dykes, M.D	Cairo	Do.
Hall	C. J. Wellborn, M.D	Gainesville	Do.
Jefferson	L. R. Bryson, M.D	Louisville	Do.
Jenkins	Guy G. Lunsford, M.D	Millen	Do.
Laurens	O. H. Cheek, M.D	Dublin	Do.
Lowndes	G. T. Crozier, M.D	Valdosta	Do.
Mitchell	C. O. Rainey, M.D	Camilla	Do.
Richmond	H. Grady Callison, M.D	Augusta	Do.
Spalding	W. C. Humphries, M.D	Griffin	Do.
Sumter	A. J. Davis, M.D	Americus	Do.
Thomas	H. B. Jenkins, M.D	Thomasville	Do.
Troup	S. C. Rutland, M.D	Lagrange	Do.
Ware	Geo. E. Atwood, M.D	Waycross	Do.
Washington	O. L. Rogers, M.D	Sandersville	Do.
District health unit no. 1. Catoosa. Dade. Walker.	Fred H. Simonton, M.D	LaFayette	District commissioner of health.
Idaho:			
Twin Falls	George C. Halley, M.D	Twin Falls	County health officer.
Illinois:			
Du Page	W. V. Hopf, D.D.S	Wheaton	County health officer.
Iowa:			
Des Moines	Finis Suggett, M.D	Burlington	Director.
Washington	H. L. Hendricks, M.D	Washington	Do.
Woodbury	W. S. Petty, M.D	Sioux City	Do.
Kansas:			
Brown	Claude P. Fryer, M.D	Hiawatha	County health officer.
Geary	Harry R. Ross, M.D	Junction City	Do.
Lyon	C. Herbert Munger, M.D	Emporia	Do.
Marion	J. H. Saylor, M.D	Marion	Do.
Sedgwick	C. R. Hepler, M.D	Wichita	Do.
Shawnee	Frank E. McCord, M.D	Topeka	Do.
Kentucky:			
Adair	Gradie R. Rowntree, M.D	Columbia	Do.
Allen	C. W. Holland, M.D	Scottsville	Do.
Anderson	S. R. Boggess, M.D	Lawrenceburg	Do.
Barren	Chas. M. Moore, M.D	Glasgow	Do.
Bath	J. S. Goodpaster, M.D	Owingsville	Do.
Bell	M. D. Hoskins, M.D	Pineville	Do.
Boyd	R. D. Higgins, M.D	Ashland	Do.
Breathitt	O. M. Goodloe, M.D	Jackson	Do.
Bullitt	G. W. Kirk, M.D	Shepherdsville	Do.
Butler	C. C. Threlkel, M.D	Morgantown	Do.
Caldwell	A. Y. Covington, M.D	Princeton	Do.
Calloway	Jas. A. Outland, M.D	Murray	Do.
Carlisle	J. F. Harrell, M.D	Bardwell	Do.
Carter	Robt. G. Townsend, M.D	Grayson	Do.
Casey	J. W. Scudder, M.D	Liberty	Do.
Clinton	J. Leland Tanner, M.D	Albany	Do.
Daviess	G. L. Thompson, M.D	Owensboro	Do.
Edmonson	Sidney Simpson, M.D	Brownsville	Do.
Elliott	Orris Gearheart, M.D	Sandy Hook	Do.
Estill	S. T. Scrivner, M.D	Irvine	Do.
Fayette	W. N. Lipscomb, M.D	Lexington	Do.
Fleming	J. B. O'Bannon, M.D	Flemingsburg	Do.
Floyd	Marvin Ransdell, M.D	Prestonsburg	Do.
Fulton	Hugh E. Prather, M.D	Hickman	Do.
Gallatin	J. H. Hutchings, M.D	Warsaw	Do.
Grant	N. H. Ellis, M. D	Williamstown	Do.
Grayson	C. F. Blankenship, M.D	Leitchfield	Do.
Green	M. W. Williamson, M.D	Greensburg	Do.

State and county	Name of health officer	Post-office address	Official title
Kentucky—Continued			
Greenup	Carl M. Gambill, M.D.	Greenup	County health officer.
Hancock		Hawesville	Do.
Hart	Chas. P. Shields, M.D.	Munfordville	Do.
Henderson	R. K. Galloway, M.D., M.P.H.	Henderson	Do.
Hickman	Chas. Hunt, M.D.	Clinton	Do.
Hopkins	C. R. Morton, M.D.	Madisonville	Do.
Jackson	C. A. Wathen, M.D.	McKee	Do.
Jefferson	E. P. Whistler, M.D.	Louisville	Do.
Kenton	H. C. White, M.D.	Covington	Do.
Knott	J. W. Duke, M.D.	Hindman	Do.
Knox	Chas. D. Cawood, M.D.	Barbourville	Do.
Laurel	G. S. Brock, M.D.	London	Do.
Lawrence	J. G. Carter, M D.	Louisa	Do.
Lee	E. M. Brown, M.D.	Beattyville	Do.
Leslie	Carl R. Bogardus, M.D.	Hyden	Do.
Letcher	R. D. Collins, M.D.	Whitesburg	Do.
Lewis	J. L. Cox, M.D.	Vanceburg	Do.
Lincoln	J. C. McGuire, M.D.	Stanford	Do.
Madison	H. G. Wells, M.D.	Richmond	Do.
Magoffin	Burman H. Preston, M.D.	Salyersville	Do.
Marshall	S L. Henson, M.D.	Benton	Do.
Martin	Wm. N. Keith, M.D.	Inez	Do.
Mason	Allen F. Murphy, M D.	Maysville	Do.
McCreary	F. W. Wilt, M.D.	Whitley City	Do.
McLean	J F. Cadden, M.D.	Calhoun	Do.
Meade	Earl Blair, M.D.	Brandenburg	Do.
Menifee	E. T. Riley, M.D.	Frenchburg	Do.
Metcalfe	Wm. M. Ison, M.D.	Edmonton	Do.
Monroe	Geo. W. Bushong, M.D.	Tompkinsville	Do.
Morgan	W. H. Wheeler, M.D.	West Liberty	Do.
Muhlenberg	Roy M. Orsburn, M.D.	Greenville	Do.
Nicholas	H. Tod Smiser, M.D.	Carlisle	Do.
Ohio	A. D. Park, M.D.	Hartford	Do.
Owsley	Don E. Wilder, M.D.	Booneville	Do.
Perry	D. D. Carr, M.D., M.P.H.	Hazard	Do.
Pike	J. J. Gerkins, M.D.	Pikeville	Do.
Powell	M. H. Skaggs, M.D.	Stanton	Do.
Pulaski	F. C. Campbell	Somerset	Do.
Robertson	L. T. Lanham, M.D.	Mt. Olivet	Do.
Rockcastle	Walker Owens, M.D.	Mt. Vernon	Do.
Rowan	T. A. E. Evans, M.D.	Morehead	Do.
Scott	F. W. Caudill, M.D.	Georgetown	Do.
Todd	Thos. J. LaMotte, M.D.	Elkton	Do.
Trigg	H. M. Batson, M.D.	Cadiz	Do.
Trimble	C. B. Walker, M.D.	Bedford	Do.
Union	J. F. Lynn, M.D.	Morganfield	Do.
Warren	G. M. Wells, M D.	Bowling Green	Do.
Wayne	Mack Roberts, M.D.	Monticello	Do.
Webster	C. M. Smith, M D.	Dixon	Do.
Whitley	L. A. Crosby, M.D.	Williamsburg	Do.
Wolfe	Taylor Center, M.D.	Campton	Do.
Louisiana: [2]			
Assumption	P M. Payne, M.D.	Napoleonville	Director.
Avoyelles	T. B. Wilson, M.D.	Marksville	Parish health officer.
Caddo	Branch J. Aymond, M.D.	Shreveport	Director.
Caldwell	Thos Burk, M.D.	Columbia	Do.
Catahoula	W. C. Coney, M.D.	Harrisonburg	Do.
Claiborne	H. R. Marlatt, M.D.	Homer	Parish health officer.
Concordia	John Schreiber, M.D.	Vidalia	Director.
De Soto	R. A. Tharp, M.D.	Mansfield	Parish health officer.
East Carroll	G. D. Williams, M.D.	Lake Providence	Director.
Franklin	R. E. Applewhite, M.D.	Winnsboro	Do.
Iberia	B. L. Stinson, M.D.	New Iberia	Parish health officer.
Iberville	J. C. Eby, M.D., Phar.D.	Plaquemine	Director.
Lafayette	R. S. Hernandez, M.D.	Lafayette	Parish health officer.
Lafourche	H. S. Smith, M.D.	Thibodaux	Do.
La Salle	H. H. Bishop, M.D.	Jena	Director.
Lincoln	R. H. Allen, M.D.	Ruston	Do.
Madison	E. S. Freeman, M.D.	Tallulah	Do.
Morehouse	N. P. Liles, M.D.	Bastrop	Do.
Natchitoches	W. W. Knipmeyer, M.D., C.P.H.	Natchitoches	Parish health officer.
Ouachita	John W. Williams, M.D., C.P.H.	Monroe	Do.
Pointe Coupee	F. F. Rougon, Ph.G., M.D.	New Roads	Do.
Rapides	Edmond Klamke, M.D., M.P.H.	Alexandria	Do.
Richland	R. O. C. Green, M.D.	Rayville	Director.
St. Landry	J. A. Coleman, M.D.	Opelousas	Do.
St. Martin	P. H. Fleming, M.D.	St. Martinville	Do.
St Mary	L. R. Craig, M.D.	Franklin	Do.

[2] Parishes.

State and county	Name of health officer	Post-office address	Official title
Louisiana—Continued			
Tensas	F. A. Thomas, M.D	St. Joseph	Director.
Terrebonne	M. F. Houston, M.D	Houma	Do.
Washington	F. A. Williams, M.D	Franklinton	Do.
Webster	W. C. Summer, M.D	Minden	Parish health officer.
West Carroll	W. L. Stone, M.D	Oak Grove	Director.
Maine:[3]			
Bar Harbor	A. A. Robertson, C.P.H	Bar Harbor	Health officer.
Rumford	Thomas S. Burr, M.D	Rumford	Do.
Sanford	W. H. Kelly, M.D	Sanford	Do.
Cooperative Health Union.	B. L. Arms, M.D	Farmington	Do.
Avon.			
Chesterville.			
Eustis.			
Livermore.			
Phillips.			
Rangeley.			
Strong.			
Temple.			
Weld.			
Wilton.			
Motbov Union	Howard L. Jackson, M.D.	Old Town	Do.
Bradley.			
Milford.			
Old Town.			
Orono.			
Veazie.			
Maryland:			
Allegany	J. P. Franklin, M.D	Cumberland	Deputy State health officer.
Anne Arundel	John H. Janney, Jr., M.D.	Annapolis	Do.
Baltimore	J. S. Bowen, M.D	Towson	Do.
Calvert	I. N. King, M.D	Prince Frederick	Do.
Carroll	W. C. Stone, M.D	Westminster	Do.
Cecil	C. A. Kane, M.D	Elkton	Do.
Charles	D. St. Clair Campbell, M.D.	La Plata	Do.
Dorchester	E. A. Jones, M.D	Cambridge	Do.
Frederick	E. C. Kefauver, M.D	Frederick	Do.
Garrett	George E. Clarke, M.D	Oakland	Do.
Harford	T. A. Callahan, M.D	Bel Air	Do.
Howard	Wm. J. French, M.D	Ellicott City	Do.
Kent	R. G. Beachley, M.D., D.P.H.	Chestertown	Do.
Montgomery	V. L. Ellicott, M.D	Rockville	Do.
Prince Georges	A. B. Hooton, M.D	Upper Marlboro	Do.
Queen Annes	James A. McCallum, M.D.	Centreville	Do.
Somerset	Robert H. Johnson, M.D.	Princess Anne	Do
Talbot	A. L. Ollar, M.D	Easton	Do.
Washington	W. Ross Cameron, M.D	Hagerstown	Do.
Wicomico	Seth H. Hurdle, M.D	Salisbury	Do.
Worcester	Bradford Massey, M.D	Pocomoke	Do.
Massachusetts:			
Barnstable	Almon P. Goff, M.D	Hyannis	County health officer.
Nashoba[4]	G. Fletcher Reeves, M.D.	Ayer	Director public health.
Southern Berkshire[4]	Harold W. Stevens, M.D.	Great Barrington	Medical director.
Michigan:			
Allegan	A. B. Mitchell, M.D	Allegan	County health officer.
Barry	M. R. Kinde, M.D	Hastings	Do.
Genesee	Leslie A. Lambert, M.D	Flint	Do.
Isabella	Thomas E. Gibson, M.D	Mount Pleasant	Do.
Kent	J. D. Brook, M.D	Grand Rapids	Do.
Midland	Arthur W. Newitt, M.D	Midland	Do.
Oakland	John D Monroe, M D	Pontiac	Do.
Ottawa	Ralph Ten Have, M.D	Grand Haven	Do.
Saginaw	Wm. H. Pickett, M.D., C.P.H.	Saginaw	Do.
Wexford	S. C. Moore, M.D	Cadillac	Do.
District health unit.	Guy R. Post, M.D., C.P.H.	White Cloud	District health officer.
Lake.			
Newaygo.			
Oceana.			
District health unit.	Stanley A. Stealy, M.D	Grayling	Do.
Crawford.			
Kalkaska.			
Missaukee.			
Roscommon.			
District health unit.	T. H. Johnston, M.D., C.P.H.	West Branch	Do.
Alcona.			
Iosco.			
Ogemaw.			
Oscoda.			

[3] Township or district.
[4] District.

State and county	Name of health officer	Post-office address	Official title
Michigan—Continued			
District health unit. Antrim. Charlevoix. Emmet Otsego.	Gordon B. Moffatt, M.D.	Charlevoix	District health officer.
District health unit. Alpena. Cheboygan. Montmorency. Presque Isle.	R. B. Howard, M.D., C.P.H.	Rogers City	Do.
Minnesota:			
St. Louis	G. J. Ferreira, M.D	Duluth	County health officer.
Mississippi:			
Adams	Loren Wallin, M.D	Natchez	Health officer.
Bolivar	R. D. Dedwylder, M.D	Cleveland	Do.
Coahoma	V. B. Harrison, M.D	Clarksdale	Do.
Forrest	B. D. Blackwelder, M.D., C.P.H.	Hattiesburg	Do.
Hancock	C. M. Shipp, M.D	Bay St. Louis	Do.
Harrison	Daniel J. Williams, M.D	Gulfport	Do.
Hinds	W. E. Noblin, M.D	Jackson	Do.
Holmes	C. J. Vaughn, M.D	Lexington	Do.
Humphreys	W. W. Scott, M.D	Belzoni	Do.
Jackson	R. G. Lander, M.D	Pascagoula	Do.
Lamar	J. N. Mason, M.D	Purvis	Do.
Lauderdale	D. V. Galloway, M.D., M.P.H.	Meridian	Do.
Lee	W. H. Cleveland, M.D	Tupelo	Do.
Leflore	L. A. Barnett, M.D	Greenwood	Do.
Lincoln	W. R. May, M.D., C.P.H.	Brookhaven	Do.
Monroe	C. H. Love, M.D	Aberdeen	Do.
Pearl River	G. E. Godman, M.D	Poplarville	Do.
Pike	T. Paul Haney, M.D., C.P.H.	McComb	Do.
Sharkey	A. K. Barrier, M.D	Rolling Fork	Do.
Sunflower	N. C. Knight, M.D	Indianola	Do.
Union	Irvin B. Trapp, M.D	New Albany	Do.
Warren	F. Michael Smith, M.D	Vicksburg	Do.
Washington	A. R Perry, M.D	Greenville	Do.
Yazoo	Hugh L. McCalip, M.D., C.P.H.	Yazoo City	Do.
Missouri:			
Boone	R. R. Robinson, M.D	Columbia	County health officer.
Buchanan	W. S. Hull, M.D	St. Joseph	Do.
Dunklin	Wheeler Davis, M.D	Kennett	Do.
Greene	J. W. Williams, M.D	Springfield	Do.
Jackson	Joseph T. Brennan, M.D.	Independence	Do.
Marion	E. M. Lucke, M.D	Hannibal	Do.
Miller	L. M. Garner, M.D	Eldon	Do.
New Madrid	Wm. N. O'Bannon, M.D.	New Madrid	Do.
Pemiscot	Fred L. Ogilvie, M.D	Caruthersville	Do.
St. Louis	Louis C. Obrock, M.D	Clayton	Do.
Montana:			
Cascade	F. L. Watkins, M.D	Great Falls	Do.
Gallatin	A. D. Brewer, M.D	Bozeman	Do.
Lewis and Clark	Wm. M. Copenhaver, B.M., M.D.	Helena	Do.
Missoula	F. D. Pease, M.D	Missoula	Do.
New Mexico:			
Bernalillo	J. R. Scott, M.D	Albuquerque	Do.
Dona Ana	C. W. Gerber, M.D	Las Cruces	Do.
Eddy	O. E. Puckett, M. D	Carlsbad	Do.
Santa Fe	E. F. McIntyre, M.D	Santa Fe	Do.
Union	C H. Douthirt, M.D	Clayton	Do.
Valencia	R. H. Wilson, M.D	Los Lunas	Do.
New York:			
Cattaraugus	R. M. Atwater, M.D., P.H. Dr.	Olean	County health commissioner.
Cortland	Daniel R. Reilly, M.D	Cortland	Do.
Suffolk	Arthur T. Davis, M.D	Riverhead	Do.
Westchester	Matthias Nicoll, Jr., M.D.	White Plains	Do.
North Carolina:			
Beaufort	D. E. Ford, M.D	Washington	Do.
Bladen	R. S. Cromartie, M.D	Elizabethtown	Do.
Buncombe	R. E. Fox, M.D	Asheville	Do.
Cabarrus	D. G. Caldwell, M.D	Concord	Do.
Columbus	Floyd Johnson, M.D	Whiteville	Do.
Cumberland	L. L. Williams, M.D	Fayetteville	Do.
Davidson	G. C. Gambrell, M.D	Lexington	Do.
Durham	J. H. Epperson, Ph.D	Durham	Do.
Edgecombe	R. E. Broadway, M.D	Tarboro	Do.
Forsythe	J. R. Hege, M.D	Winston-Salem	Do.
Franklin	R. F. Yarborough, M.D	Louisburg	Do.

State and county	Name of health officer	Post-office address	Official title
North Carolina—Con.			
Gaston	R. E. Rhyne, M.D.	Gastonia	County health commissioner.
Granville	J. A. Morris, M.D.	Oxford	Do.
Guilford	R. M. Buie, M.D.	Greensboro	Do.
Halifax	Z. P. Mitchell, M.D.	Weldon	Do.
Lenoir	Z. V. Moseley, M.D.	Kinston	Do.
Mecklenburg	F. H. Hand, M.D.	Charlotte	Do.
Moore	John Symington, M.D.	Carthage	Do.
New Hanover	A. H. Elliot, M.D.	Wilmington	Do.
Northampton	M. H. Seawell, M.D.	Jackson	Do.
Pitt	R. S. McGeachy, M.D.	Greenville	Do.
Randolph	G. H. Sumner, M.D.	Asheboro	Do.
Richmond	C. N. Sisk, M.D.	Rockingham	Do.
Robeson	E. R. Hardin, M.D.	Lumberton	Do.
Rowan	C. W. Armstrong, M.D.	Salisbury	Do.
Rutherford	J. C. Twitty, M.D.	Rutherfordton	Do.
Sampson	S. Glenn Wilson, M.D.	Clinton	Do.
Surry	T. C. Britt, M.D.	Mount Airy	Do.
Vance	C. H. White, M.D.	Henderson	Do.
Wake	A. C. Bulla, M.D.	Raleigh	Do.
Wayne	F. M. Register, M.D.	Goldsboro	Do.
Wilkes	A. J. Eller, M.D.	Wilkesboro	Do.
Wilson	W. H. Anderson, M.D.	Wilson	Do.
Ohio:			
Allen	J. J. Sutter, M.D.	Lima	Health commissioner.
Ashtabula	W. S. Weiss, M.D.	Jefferson	Do.
Belmont	F. R. Dew, M.D.	St. Clairsville	Do.
Butler	C. J. Baldridge, M.D.	Hamilton	Do.
Clinton	W. K. Ruble, M.D.	Wilmington	Do.
Columbiana	T. T. Church, M.D.	Lisbon	Do.
Coshocton	D. M. Criswell, M.D.	Coshocton	Do.
Crawford	G. T. Wasson, M.D.	Bucyrus	Do.
Cuyahoga	Robert Lockhart, M.D.	Cleveland	Do.
Darke	W. D. Bishop, M.D.	Greenville	Do.
Delaware	B. B. Barber, M.D.	Delaware	Do.
Erie	F. M. Houghtaling, M.D.	Sandusky	Do.
Fayette	J. F. Wilson, M.D.	Washington C.H.	Do.
Franklin	B. E. Neiswander, M.D.	Columbus	Do.
Hamilton	E. H. Schoenling, M.D.	Cincinnati	Do.
Hancock	S. F. Whisler, M.D.	Findlay	Do.
Hocking	W. B. Lacock, M.D.	Logan	Do.
Huron	B. C. Pilkey, M.D.	Norwalk	Do.
Jefferson	J. P. Young, M.D.	Steubenville	Do.
Lorain	H. R. O'Brien, M.D.	Oberlin	Do.
Lucas	F. F. DeVore, M.D.	Toledo	Do.
Mahoning	G. Y. Davis, M.D.	Youngstown	Do.
Marion	N. Sifritt, M.D.	Marion	Do.
Medina	T. W. Mahoney, M.D.	Medina	Do.
Meigs	W. S. Ellis, M.D.	Pomeroy	Do.
Mercer	F. E. Ayers, M.D.	Celina	Do.
Miami	E. R. Hiatt, M.D.	Troy	Do.
Montgomery	H. H. Pansing, M.D.	Dayton	Do.
Morrow	R. L. Pierce, M.D.	Mt. Gilead	Do.
Perry	F. J. Crosbie, M.D.	New Lexington	Do.
Pickaway	C. C. Beale, M.D.	Circleville	Do.
Preble	J. I. Nisbet, M.D.	Eaton	Do.
Richland	M. C. Hanson, M.D.	Mansfield	Do.
Ross	R. E. Bower, M.D.	Chillicothe	Do.
Scioto	G. W. Fishbaugh, M.D.	Portsmouth	Do.
Seneca	J. J. Heaton, M.D.	Tiffin	Do.
Shelby	A. B. Lippert, M.D.	Sidney	Do.
Stark	O. C. Ricksecker, M.D.	Canton	Do.
Summit	R. H. Markwith, M.D.	Akron	Do.
Trumbull	L. A. Connell, M.D.	Warren	Do.
Tuscarawas	J. Blickensderfer, M.D.	New Philadelphia	Do.
Washington	A. G. Sturgiss, M.D.	Marietta	Do.
Wayne	W. G. Rhoten, M.D.	Wooster	Do.
Wood	H. J. Powell, M.D.	Bowling Green	Do.
Oregon:			
Clackamas	A. H. Johnston, M.D.	Oregon City	County health officer.
Douglas	B. R. Shoemaker, M.D.	Roseburg	Do.
Jackson	C. I. Drummond, M.D.	Medford	Do.
Klamath	G. S. Newsom, M.D.	Klamath Falls	Do
Lane	R. C. Romig, M.D.	Eugene	Do.
Marion	Vernon A. Douglas, M.D.	Salem	Do.
Pennsylvania:			
Allegheny	Eugene Conti, M.D.	Pittsburgh	County medical director.
Bucks	Charles W. Many, M.D.	Doylestown	Do.
Luzerne	W. F. Davison, M.D.	Wilkes-Barre	Do.
South Carolina:			
Aiken	J. T. Hair, M.D.	Aiken	Health officer.
Anderson	E. E. Epting, M.D.	Anderson	Do.
Beaufort	H. F. Wilson, M.D.	Beaufort	Do.
Berkeley	W. K. Fishburne, M.D.	Moncks Corner	Do.
Charleston	Leon Banov, M.D.	Charleston	Do.

State and county	Name of health officer	Post-office address	Official title
South Carolina—Con.			
Cherokee	E. P. White, M.D	Gaffney	Health officer.
Darlington	W. A. Carrigan, M.D	Darlington	Do.
Dillon	G. E. McDaniel, M.D	Dillon	Do.
Dorchester	G. R. O'Daniel, M.D	St. George	Do.
Fairfield	J. L. Bryson, M.D	Winnsboro	Do.
Florence	J R. Claussen, M.D	Florence	Do.
Georgetown	P. E. Assey, M.D	Georgetown	Do.
Greenville	Baylis Earle, M.D	Greenville	Do.
Greenwood	J. E Brodie, M.D	Greenwood	Do.
Horry	R. W. Ball, M.D	Conway	Do.
Kershaw	A. W. Humphries, M.D	Camden	Do.
Lexington		Lexington	Do.
Marion	B. M. Montgomery, M.D.	Marion	Do.
Newberry	H. B. Senn, M.D	Newberry	Do.
Oconee	T. G. Hall, M.D	Walhalla	Do.
Orangeburg	G. C. Bolin, M.D	Orangeburg	Do.
Pickens	W. B. Furman, M.D	Easley	Do.
Richland	J. B. Setzler, M.D	Columbia	Do.
Spartanburg	J. M. Beeler, M.D	Spartanburg	Do.
South Dakota:			
Pennington	F. J Austin, M.D	Rapid City	Director.
Tennessee:			
Bledsoe	H. M. Roberson, M.D	Pikeville	Health officer.
Bradley	W C. Sanford, M.D	Cleveland	Director.
Carter	O. F. Agee, M.D	Elizabethton	Do.
Davidson	J. J. Lentz. M.D	Nashville	Health officer.
Dyer	E. E. Carrier, M.D	Dyersburg	Do.
Fentress	J. B. White, M.D	Jamestown	Director.
Gibson	F. L. Roberts, M.D	Trenton	Health officer.
Giles	Crit Pharris, M.D	Pulaski	Director.
Greene	R. S. Cowles, M.D	Greeneville	Health officer.
Hamilton	J. C. Eldridge, M.D	Chattanooga	Director.
Hardeman	R. L. Cobb, M.D	Bolivar	Do.
Humphreys	J. W. Frost, M.D	Waverly	Do.
Knox	A. G. Hufstedler, M.D	Knoxville	Do.
Lake	J. P. Moon, M.D	Tiptonville	Do.
Lauderdale	R. B. Griffin, M.D	Ripley	County health officer.
Lewis	S. P. Simpson, M.D	Hohenwald	Do.
Lincoln	D. D. Howser, M.D	Fayetteville	Director.
Maury	H. C. Busby, M.D	Columbia	Do.
Monroe	P. H. Edwards, Jr., M.D.	Madisonville	Do.
Montgomery	F. J. Malone, M.D	Clarksville	County health officer.
Obion	W. B. Harrison, M.D	Union City	Do.
Roane	J. C. Fly, M.D	Kingston	Do.
Rutherford	J. B. Black, M.D	Murfreesboro	Do.
Sevier	C. P. Wilson, M.D	Sevierville	Director.
Shelby	W. P. Moore, M.D	Memphis	Health officer.
Sullivan	F. L. Moore, M.D	Blountville	Do.
Sumner	G. M. Morris, M.D	Gallatin	Director.
Tipton	A. J. Butler, M.D	Covington	Do.
Unicoi	J. L. Cochran, M.D	Erwin	Do.
Washington	W. L. Poole, M.D., M.P.H.	Jonesboro	Do.
Weakley	M. D. Ingram, M.D	Dresden	County health officer.
Williamson	R. H Hutcheson, M.D	Franklin	Acting health officer.
Wilson	W. D. Cagle, M.D	Lebanon	County health officer.
District no. 1	E. W. Clark, M.D	Livingston	Director.
Overton.			
Pickett.			
District no. 2	F. B. Clark, M.D	Gainesboro	Do.
Clay.			
Jackson.			
District no. 3	J. Y. O'Daniel, M.D	Dayton	Do.
Meigs.			
Rhea.			
District no. 4	U. B. Bowden, M.D	Pelham	Do.
Grundy.			
Sequatchie.			
Texas:			
Cameron	W. E. Spivey, M D	San Benito	Do.
Dallas	H. E. Duncan, M.D	Dallas	Do.
Gregg	G. S. Atkinson, M.D	Longview	Do.
Hidalgo	D. R. Handley, M.D	Edinburg	County health officer.
McLennan	W. F. Curran, M.D	Waco	Do.
Nolan	E. W. Prothro, M.D	Sweetwater	Director.
Potter	B. M. Primer, M.D., M.P.H.	Amarillo	Do.
Smith	B. T. Bryant, M.D	Tyler	County health officer.
Starr	C. Solis, M.D	Rio Grande City	Do.
Tarrant	Burke Brewster, M.D	Fort Worth	Do.

State and county	Name of health officer	Post-office address	Official title
Utah:			
Davis	Sumner Gleason, M.D., D D S.	Kaysville	County health officer.
Utah	Palmer Romaine Bowdish, M.D., A.B.	Provo	Do.
Virginia:			
Accomac	Claude J. Bradshaw, M.D.	Accomac	Health officer.
Albemarle	Edward L. McQuade, M.D., C.M.	Charlottesville	Do.
Arlington	P. M. Chichester, M.D.	Clarendon	Do.
Augusta	Harry M. Wallace, M.D.	Staunton	Do.
Brunswick-Greensville.[5]	Thomas H. Valentine, M.D.	Lawrenceville	Do.
Fairfax	Adrian L. Carson, Jr., M.D.	Fairfax	Do.
Halifax	Shockley D. Gardner, M.D.	South Boston	Do.
Henrico	Allen L. McLean, M.D., C.M.	Richmond	Do.
Isle of Wight-Nansemond.[5]	Challis H. Dawson, M.D.	Suffolk	Do.
Norfolk-Princess Anne.[5]	Josiah Leake, M.D.	Portsmouth	Do.
Pittsylvania	William H. Walcott, M.D.	Chatham	Do.
Rockbridge	Robert P. Cooke, M.D.	Lexington	Do.
Southampton	Peter P. Causey, M.D.	Courtland	Do.
Southside Health District (9-county project).	W. A. Brumfield, M.D.	Farmville	District health officer.
Amelia.			
Appomattox.			
Buckingham.			
Charlotte.			
Cumberland.			
Lunenburg.			
Nottoway.			
Powhatan.			
Prince Edward.			
Washington:			
Chelan	Paul L. West, M.D.	Wenatchee	Health officer.
Clarke	Geo. H. T. Sparling, M.D.	Vancouver	Do.
King	C. L. Dixon, M.D.	Seattle	Do.
Snohomish	H. L. Eldridge, M.D.	Everett	Do.
Spokane	W. O. Wisner, M.D.	Spokane	Do.
Walla Walla	J. E. Vanderpool, M.D.	Walla Walla	Do.
Whitman	R. J. Skaife, M.D.	Colfax	Do.
Yakima	Lloyd Moffitt, M.D.	Yakima	Do.
West Virginia:			
Berkeley	Edwin Cameron, M.D.	Martinsburg	County Health Officer.
Boone	C. E. Lewis, M.D.	Madison	Do.
Fayette	H. H. Puckett, M.D.	Fayetteville	Do.
Hancock	T. E. Cato, M.D.	New Cumberland	Do.
Harrison	A. J. Kemper, M.D.	Clarksburg	Do.
Kanawha	John Thames, M.D.	Charleston	Do.
Logan	V. A. Deason, M.D.	Logan	Do.
Marion	F. F. Sowers, M.D.	Fairmont	Do.
Marshall	W. G. C. Hill, M.D.	Moundsville	Do.
Monongalia	R. C. Farrier, M.D.	Morgantown	Do.
Ohio	W. H. McLain, M.D.	Wheeling	Do.
Preston	E. R. Davies, M.D.	Kingwood	Do.
Raleigh	W. W. Hume, M.D.	Beckley	Do.
Wood	A. D. Knott, M.D.	Parkersburg	Do.

[5] Bicounty project.

COURT DECISION RELATING TO PUBLIC HEALTH

Order concerning importation of cattle to safeguard against Bang's disease upheld.—(United States Supreme Court; *Mintz et al.* v. *Baldwin*, 53 S. Ct. 611; decided May 8, 1933.) The commissioner of agriculture and markets of the State of New York, acting in pursuance of statutory authority, adopted an order which was designed to guard against Bang's disease, bovine infectious abortion. This order required that all cattle over 6 months of age imported for dairy or breeding purposes should come directly from herds certified to be

free from Bang's disease. The plaintiffs, who were engaged in the cattle-raising business in Wisconsin, shipped 20 head of cattle from that State for delivery to a consignee in New York State. The animals so shipped were accompanied by a certificate which was sufficient as to them, but there was nothing to show the freedom from Bang's disease of the herd or herds from which they came. Because of this, the New York State commissioner refused to permit the cattle to be delivered, and the plaintiffs were compelled to take them out of the State. Suit was brought against the commissioner by the plaintiffs for a temporary and perpetual injunction to restrain the enforcement of the order. The claim advanced by the plaintiffs was that the commissioner's order was repugnant to the commerce clause of the Federal Constitution because in conflict with Federal statutes relating to interstate transportation of livestock. The lower court denied a temporary injunction and dismissed the plaintiffs' bill. On appeal by the plaintiffs to the United States Supreme Court, that Court said that the order was an inspection measure and that it could not be maintained that the order so unnecessarily burdened interstate transportation as to contravene the commerce clause. The Court then stated:

> * * * Unless limited by the exercise of Federal authority under the commerce clause, the State has power to make and enforce the order. The purpose of Congress to supersede or exclude State action against the ravages of the disease is not lightly to be inferred. The intention so to do must definitely and clearly appear. * * *

Regarding the plaintiffs' contention that the order conflicted with the Federal cattle contagious diseases act of March 3, 1905, relating to quarantine by the Secretary of Agriculture and the transportation of cattle from quarantined districts, the Supreme Court held this contention to be groundless, saying:

> * * * That act applies only to shipments from quarantined districts that it authorizes the secretary to establish. Plaintiffs' shipments are not made from such a district.

Proceeding, the court said that an examination of the Federal cattle contagious diseases act of February 2, 1903, was necessary. This act, intended to enable the Secretary of Agriculture to prevent the spread of disease among cattle and other livestock, authorized and directed him from time to time to establish such regulations concerning interstate transportation from any place "where he may have reason to believe such diseases may exist * * *." It also provided that "Whenever any inspector or assistant inspector of the Bureau of Animal Industry shall issue a certificate showing that such officer had inspected any cattle * * * which were about to be shipped * * * from such locality * * * and had found them free from * * * communicable disease, such animals so inspected

and certified may be shipped, driven, or transported from such place" in interstate commerce "without further inspection or the exaction of fees of any kind except such as may at any time be ordered or exacted by the Secretary of Agriculture. * * *[3]" In November 1932, by letter to the defendant commissioner, the Federal Department of Agriculture had declared that it had issued no quarantine or regulations pertaining to Bang's disease and that its policy for the present was to leave the control with the various States. Relative to the application of the 1903 act to the instant case, the Supreme Court said:

> Plaintiffs' cattle were not inspected by, and no certificate was issued under, Federal authority. Unless the act itself operates to prevent the enforcement of the order, the suit was rightly dismissed. The express exclusion of State inspection extends only to cases where Federal inspection has been made and certificate issued. The clause cannot be read to extend to other cases. The expression of purpose so to limit the exertion of State power strongly suggests that Congress intended not otherwise to trammel the enforcement of State quarantine measures. [Case cited.] Much weight is to be given to the practical interpretation of the act by the Federal department through its acquiescence in the enforcement of State measures to suppress Bang's disease. This case is governed by the principle on which rests the decision in *Asbell* v. *Kansas* (209 U.S. 251, 28 S. Ct. 485, 52 L. Ed. 778, 14 Ann. Cas. 1101). Defendant's order does not conflict with the act of 1903.

The decree of the lower court was affirmed.

DEATHS DURING WEEK ENDED JUNE 24, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce

	Week ended June 24, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	7,403	7,097
Deaths per 1,000 population, annual basis	10.4	10.1
Deaths under 1 year of age	531	590
Deaths under 1 year of age per 1,000 estimated live births [1]	44	48
Deaths per 1,000 population, annual basis, first 25 weeks of year	11.6	12.0
Data from industrial insurance companies:		
Policies in force	67,755,624	72,457,832
Number of death claims	13,121	12,405
Death claims per 1,000 policies in force, annual rate	10.1	9.0
Death claims per 1,000 policies, first 25 weeks of year, annual rate	10.5	10.2

[1] 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended July 1, 1933, and July 2, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 1, 1933, and July 2, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended July 1, 1933	Week ended July 2, 1932	Week ended July 1, 1933	Week ended July 2, 1932	Week ended July 1, 1933	Week ended July 2, 1932	Week ended July 1, 1933	Week ended July 2, 1932
New England States:								
Maine	3	1	5		10	58	1	0
New Hampshire		1			9	11	0	0
Vermont					40	116	0	0
Massachusetts	11	45		1	440	563	0	3
Rhode Island	1	6	1			12	0	0
Connecticut	4	4	1	2	90	133	0	0
Middle Atlantic States:								
New York	43	57	[1] 3	[1] 3	792	1,434	3	4
New Jersey	25	20	3	4	404	409	0	1
Pennsylvania	36	54			575	656	2	1
East North Central States:								
Ohio	27	37	32	5	104	818	1	3
Indiana [2]	13	10	12	5	69	29	2	2
Illinois	12	33	18	49	236	293	8	3
Michigan	21	20		2	199	1,498	2	4
Wisconsin	5	10	8	11	140	630	0	2
West North Central States:								
Minnesota	7	8	1	1	117	14	0	0
Iowa	6	4			25	3	0	1
Missouri	29	21	4		142	16	0	0
North Dakota	1				10	47	0	0
South Dakota	2				4	3	0	0
Nebraska	6	5			68	4	3	0
Kansas	1	5		1	88	100	1	1
South Atlantic States:								
Delaware	2	1			8	1	0	0
Maryland [2 3 4]	1	6	2	3	15	21	1	0
District of Columbia	3	8			43	6	0	0
Virginia [3]	6	7			97	38	2	0
West Virginia [3]	4	7		4	11	111	0	1
North Carolina [3]	4	12	1	1	248	247	2	0
South Carolina [3]	8	2	35	121	104	60	0	0
Georgia [3]	14	5		9	119	5	0	2
Florida	2	2	1		6	6	0	0
East South Central States:								
Kentucky	1	6			10	32	1	0
Tennessee	7	3	14	5	89		1	0
Alabama [3]	6	10	4	3	27		0	1
Mississippi	3	4					0	

See foot notes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 1, 1933, and July 2, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended July 1, 1933	Week ended July 2, 1932	Week ended July 1, 1933	Week ended July 2, 1932	Week ended July 1, 1933	Week ended July 2, 1932	Week ended July 1, 1933	Week ended July 2, 1932
West South Central States:								
Arkansas		6		5	75	1	0	0
Louisiana [3]	10	10	8	6	11	7	1	1
Oklahoma [5]	9	7	9	4	14	28	0	1
Texas [3]	59	21	59	19	253	16	4	0
Mountain States:								
Montana [2]				3	38	38	0	0
Idaho [2]		3				3	0	0
Wyoming [2]	1				4	35	0	0
Colorado	6	8			11	57	0	0
New Mexico	3	3	1		4	3	0	0
Arizona					36	2	0	0
Utah [4]					43	4	0	0
Pacific States:								
Washington	4	4			67	86	1	1
Oregon [2]		3	10	5	15	58	1	0
California	42	20	12	3	534	126	2	0
Total	448	499	244	275	5,453	7,838	39	32

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended July 1, 1933	Week ended July 2, 1932	Week ended July 1, 1933	Week ended July 2, 1932	Week ended July 1, 1933	Week ended July 2, 1932	Week ended July 1, 1933	Week ended July 2, 1932
New England States:								
Maine	0	1	3	15	0	0	7	2
New Hampshire	0	0	11	10	0	0	1	0
Vermont	0	0	1	3	0	0	0	0
Massachusetts	5	2	168	210	0	0	2	1
Rhode Island	1	0	13	21	0	0	0	0
Connecticut	2	1	33	34	0	0	1	1
Middle Atlantic States:								
New York	7	4	232	376	0	1	17	10
New Jersey	0	0	81	126	0	0	4	5
Pennsylvania	3	0	288	285	0	0	21	15
East North Central States:								
Ohio	3	1	262	174	4	6	12	17
Indiana [2]	1	1	21	34	2	5	22	7
Illinois	4	4	134	129	0	1	21	20
Michigan	1	0	171	274	5	4	1	11
Wisconsin	1	2	65	23	0	0	1	3
West North Central States:								
Minnesota	0	2	23	23	1	0	0	0
Iowa	1	0	4	12	12	9	0	1
Missouri	0	0	23	17	0	6	21	4
North Dakota	0	5	2	14	2	3	0	3
South Dakota	0	0	8	2	0	3	0	3
Nebraska	0	0	14	11	4	2	0	0
Kansas	0	0	17	9	1	6	4	6
South Atlantic States:								
Delaware	0	0	2	7	0	0	0	0
Maryland [2 3 4]	1	0	27	31	0	0	19	10
District of Columbia	0	0	7	5	0	0	0	1
Virginia [3]	0	0	22	6	0	0	29	35
West Virginia [2]	3	0	11	11	0	0	18	25
North Carolina [3]	0	3	22	31	0	0	43	42
South Carolina [2]	0	2	1	3	1	0	37	47
Georgia [3]	0	0		2	0	0	44	54
Florida	0	0	2	4	0	1	4	5
East South Central States:								
Kentucky	0	1	10	9	0	2	32	72
Tennessee	2	0	7	7	0	7	58	91
Alabama [3]	0	0	9	11	0	2	30	20
Mississippi	0	0	4	3	1	1	25	20

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 1, 1933, and July 2, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended July 1, 1933	Week ended July 2, 1932	Week ended July 1, 1933	Week ended July 2, 1932	Week ended July 1, 1933	Week ended July 2, 1932	Week ended July 1, 1933	Week ended July 2, 1932
West South Central States:								
Arkansas	0	0	1	1	0	1	17	19
Louisiana [3]	0	1	9	5	0	0	32	27
Oklahoma [5]	1	0	8	12	0	0	28	17
Texas [3]	1	4	41	24	32	3	54	25
Mountain States:								
Montana [2]	0	0	18	3	0	1	7	3
Idaho [2]	0	0	1	2	3	0	1	3
Wyoming [2]	0	0	3	5	0	0	1	0
Colorado	0	0	20	7	21	0	0	5
New Mexico	0	0	5	6	0	0	1	5
Arizona	0	0	3	3	0	0	3	2
Utah [4]	0	0	5	--------	0	0	0	0
Pacific States:								
Washington	0	4	3	4	6	13	2	4
Oregon [2]	0	0	14	19	20	3	1	2
California	4	4	76	56	15	9	3	8
Total	41	42	1,905	2,079	130	89	624	651

[1] New York City only.
[2] Rocky Mountain spotted fever, week ended July 1, 1933, 18 cases as follows: Indiana, 1; Maryland, 4; Montana, 3; Idaho, 3; Wyoming, 5; Oregon, 2.
[3] Typhus fever, week ended July 1, 1933, 31 cases as follows: Maryland, 1; Virginia, 1: West Virginia, 1; North Carolina, 2; South Carolina, 1; Georgia, 1; Alabama, 13; Louisiana, 1; Texas, 10.
[4] Week ended Friday.
[5] Figures for 1933 are exclusive of Oklahoma City and Tulsa, and for 1932 are exclusive of Tulsa only.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
May 1933										
Arkansas	1	19	34	75	1,276	85	0	11	12	21
Delaware	--------	4	1	--------	45	--------	--------	59	0	3
Nevada	2	3	6	--------	1	--------	0	15	0	0
Oklahoma [1]	8	21	49	59	623	2	1	36	26	16
Puerto Rico	--------	35	119	2,403	252	11	0	--------	0	66
Texas	7	193	330	616	--------	51	5	201	--------	73
Virginia	5	39	99	9	1,187	17	1	139	2	31
Washington	6	27	42	--------	354	--------	4	222	21	7

[1] Exclusive of Oklahoma City and Tulsa.

May 1933

	Cases
Anthrax:	
Delaware	1
Chicken pox:	
Arkansas	141
Delaware	29
Nevada	9
Oklahoma [1]	72
Puerto Rico	126
Virginia	384
Washington	747
Dengue.	
Oklahoma [1]	1
Dysentery:	
Oklahoma [1]	4
Puerto Rico	310
Dysentery and diarrhea:	
Virginia	271
German measles:	
Delaware	1
Washington	29
Filariasis:	
Puerto Rico	6
Impetigo contagiosa:	
Washington	4
Leprosy:	
Puerto Rico	1
Lethargic encephalitis:	
Texas	1
Virginia	2
Washington	1

	Cases
Mumps:	
Arkansas	46
Delaware	1
Oklahoma [1]	38
Puerto Rico	68
Virginia	63
Washington	347
Ophthalmia neonatorum:	
Oklahoma [1]	1
Puerto Rico	5
Virginia	1
Paratyphoid fever:	
Arkansas	3
Puerto Rico	4
Texas	5
Virginia	2
Puerperal septicemia:	
Puerto Rico	11
Washington	1
Rabies in animals:	
Washington	21
Rocky Mountain spotted fever:	
Nevada	5
Virginia	2
Scabies:	
Oklahoma [1]	6
Septic sore throat:	
Oklahoma [1]	15
Virginia	5
Washington	1

	Cases
Tetanus:	
Puerto Rico	23
Virginia	1
Tetanus, infantile:	
Puerto Rico	22
Trachoma:	
Arkansas	1
Oklahoma [1]	4
Puerto Rico	6
Tularaemia.	
Arkansas	5
Oklahoma [1]	1
Virginia	1
Typhus fever:	
Delaware	1
Undulant fever:	
Arkansas	1
Virginia	1
Washington	5
Vincent's angina:	
Oklahoma [1]	2
Whooping cough:	
Arkansas	36
Delaware	8
Nevada	1
Oklahoma [1]	41
Puerto Rico	184
Virginia	210
Washington	49

[1] Exclusive of Oklahoma City and Tulsa.

WEEKLY REPORTS FROM CITIES

City reports for week ended June 24, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0		0	0	0	1	0	1	1	2	14
New Hampshire:											
Concord	0		0	0	0	0	0	1	0	0	7
Nashua	0		0	0	0	0	0	0	0	0	
Vermont:											
Barre	0		0	2	0	0	0	0	0	1	3
Burlington	0		0	0	0	0	0	0	0	4	5
Massachusetts:											
Boston	4		0	192	11	52	0	13	0	60	163
Fall River	0		0	3	0	5	0	1	0	8	25
Springfield	0		0	1	0	4	0	0	0	7	30
Worcester	1		0	73	4	13	0	2	0	4	46
Rhode Island:											
Pawtucket	0		0	2	0	0	0	0	0	4	16
Providence	3		0	4	2	8	0	1	0	35	50
Connecticut:											
Bridgeport	0		0	15	1	13	0	1	0	1	29
Hartford	0		0	2	1	10	0	0	0	2	30
New Haven	0		0	4	0	3	0	1	0	11	33
New York:											
Buffalo	6		0	72	13	27	0	9	0	35	122
New York	30	6	3	485	97	79	0	92	12	125	1,319
Rochester	1		0	0	0	18	0	0	0	7	71
Syracuse	0		0	0	3	5	0	2	0	9	34
New Jersey:											
Camden	2		0	5	1	11	0	0	0	0	33
Newark	1	2	0	48	6	9	0	5	1	37	87
Trenton	0		1	27	4	4	0	5	0	5	49
Pennsylvania:											
Philadelphia	0	1	1	279	12	55	0	22	3	5	401
Pittsburgh	4		0	3	8	37	0	7	0	71	121
Reading	0		0	7	0	2	0	0	0	6	22
Scranton	0			0		4	0		1	2	
Ohio:											
Cincinnati	3		0	11	4	22	0	6	0	8	125
Cleveland	9	8	1	5	11	46	0	13	2	51	162
Columbus	0		0	2	5	19	0	4	0	0	76
Toledo	2		0	28	1	65	0	3	0	33	58

City reports for week ended June 24, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Indiana:											
Fort Wayne	3	--------	0	0	1	3	0	2	0	0	42
Indianapolis	0	--------	0	40	5	1	0	2	0	14	--------
South Bend	0	--------	0	1	1	1	0	1	0	0	19
Terre Haute	0	--------	0	12	0	3	0	0	0	0	19
Illinois:											
Chicago	2	--------	0	223	35	132	0	51	1	32	649
Springfield	0	--------	0	1	2	1	0	1	0	5	27
Michigan:											
Detroit	14	--------	2	97	7	36	0	25	0	117	223
Flint	1	--------	0	1	2	9	0	2	0	5	25
Grand Rapids	0	--------	0	0	0	7	0	1	0	7	24
Wisconsin:											
Kenosha	0	--------	0	0	0	2	0	0	0	15	3
Madison	1	--------	--------	13	--------	0	0	--------	0	10	--------
Milwaukee	0	--------	0	2	2	21	0	8	2	91	101
Racine	0	--------	0	0	0	9	0	0	0	27	13
Superior	0	--------	0	0	0	0	0	0	0	8	5
Minnesota:											
Duluth	0	--------	0	22	0	0	0	1	0	22	19
Minneapolis	1	--------	0	2	2	9	0	1	0	10	110
St. Paul	0	--------	0	16	3	15	0	5	1	72	66
Iowa:											
Des Moines	0	--------	--------	1	--------	1	1	--------	0	2	28
Sioux City	1	--------	--------	0	--------	0	0	--------	0	4	--------
Waterloo	0	--------	--------	0	--------	0	0	--------	0	0	--------
Missouri:											
Kansas City	0	--------	0	3	6	7	0	6	0	8	101
St. Joseph	1	--------	0	3	1	0	0	1	0	0	12
St. Louis	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
North Dakota:											
Fargo	0	--------	0	1	0	1	0	0	0	0	4
Grand Forks	0	--------	0	0	0	0	0	0	0	2	--------
South Dakota:											
Aberdeen	0	--------	--------	1	--------	0	0	--------	1	0	--------
Nebraska:											
Omaha	1	--------	0	64	1	1	2	0	0	7	59
Kansas:											
Topeka	0	--------	0	7	0	3	0	0	0	6	12
Wichita	0	--------	0	3	2	0	0	0	0	5	16
Delaware:											
Wilmington	0	--------	0	3	0	0	0	0	0	8	23
Maryland:											
Baltimore	1	--------	0	2	13	24	0	20	0	53	186
Cumberland	0	--------	0	2	0	2	0	0	0	0	11
Frederick	0	--------	0	0	0	0	0	0	0	0	1
District of Col.:											
Washington	1	--------	0	16	8	7	0	18	1	12	171
Virginia:											
Lynchburg	0	--------	0	20	0	1	0	0	2	18	13
Norfolk	0	--------	0	0	1	3	0	2	0	6	27
Richmond	0	--------	0	3	3	2	0	6	0	4	57
Roanoke	0	--------	0	1	1	2	0	0	0	1	20
West Virginia:											
Charleston	0	--------	0	0	0	0	0	1	3	0	11
Huntington	0	--------	--------	0	--------	0	0	--------	0	1	--------
Wheeling	0	--------	0	2	1	1	0	1	0	15	18
North Carolina:											
Raleigh	0	--------	0	0	0	0	0	2	1	0	20
Wilmington	0	--------	0	4	0	0	0	1	1	0	14
Winston-Salem	0	--------	0	0	0	3	0	0	0	1	13
South Carolina:											
Charleston	0	4	0	0	0	0	0	2	4	8	20
Columbia	0	--------	0	0	2	0	0	0	0	0	14
Greenville	0	--------	0	0	1	0	0	1	0	0	7
Georgia:											
Atlanta	5	10	0	6	7	0	0	1	8	38	73
Brunswick	0	--------	0	0	0	0	0	0	0	0	3
Savannah	1	7	1	0	1	0	0	0	0	3	30
Florida:											
Miami	0	--------	0	0	0	0	0	3	1	1	31
Tampa	0	--------	0	0	1	0	0	2	0	0	15
Kentucky:											
Ashland	0	--------	0	0	0	0	0	0	0	9	--------
Lexington	0	--------	0	0	1	0	0	1	0	2	--------
Louisville	2	--------	0	8	5	4	0	7	0	6	75

City reports for week ended June 24, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Tennessee:											
Memphis	0	-------	0	50	7	2	0	5	1	26	97
Nashville	1	-------	1	5	1	1	0	2	1	0	48
Alabama:											
Birmingham	1	-------	0	0	0	1	0	3	1	0	65
Mobile	1	-------	0	3	1	2	0	3	1	0	23
Montgomery	0	-------	-------	0	-------	1	0	-------	0	0	-------
Arkansas:											
Fort Smith	0	-------	-------	0	-------	0	0	-------	0	1	-------
Little Rock	0	-------	0	10	2	0	0	2	1	0	6
Louisiana:											
New Orleans	2	2	2	7	12	5	0	9	0	13	162
Shreveport	0	-------	0	0	0	2	0	2	1	1	51
Oklahoma:											
Tulsa	0	-------	-------	30	-------	1	4	-------	1	16	-------
Texas:											
Dallas	12	-------	0	6	5	7	0	5	0	0	61
Fort Worth	0	-------	0	0	1	0	0	2	3	3	37
Galveston	2	-------	0	0	2	0	0	1	1	0	28
Houston	5	-------	0	1	3	0	0	6	0	0	-------
San Antonio	0	-------	1	7	2	1	0	9	0	0	74
Montana:											
Billings	0	-------	0	0	0	1	0	0	0	0	5
Great Falls	0	-------	0	0	0	0	0	1	0	8	3
Helena	0	-------	0	0	0	0	0	0	0	0	3
Missoula	0	-------	0	1	0	0	0	0	0	0	6
Idaho:											
Boise	0	-------	0	0	0	0	1	0	0	1	8
Colorado:											
Denver	1	19	0	4	6	2	0	1	0	2	71
Pueblo	0	-------	0	1	0	1	0	0	0	0	-------
New Mexico:											
Albuquerque	0	-------	0	2	1	0	0	1	1	2	9
Utah:											
Salt Lake City	0	-------	0	45	2	6	0	1	0	16	28
Nevada:											
Reno	0	-------	0	0	1	0	0	0	0	0	3
Washington:											
Seattle	0	-------	-------	0	-------	11	0	-------	2	8	-------
Spokane	0	-------	-------	9	-------	0	0	-------	0	0	-------
Tacoma	0	-------	0	0	0	0	0	0	0	2	27
Oregon:											
Portland	0	-------	0	1	2	4	12	1	0	6	63
Salem	0	2	-------	3	-------	0	0	-------	0	-------	-------
California:											
Los Angeles	12	4	1	188	13	62	9	25	0	46	280
Sacramento	1	-------	0	0	1	1	0	2	0	23	20
San Francisco	2	1	2	2	6	1	0	11	0	23	135

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Illinois:			
Boston	0	2	0	Chicago	5	3	1
New York:				Michigan:			
New York	5	0	1	Flint	0	1	0
New Jersey:				Minnesota:			
Newark	1	1	0	Minneapolis	1	0	0
Pennsylvania:				Iowa:			
Philadelphia	1	1	0	Sioux City	1	0	0
Pittsburgh	1	0	0	Louisiana:			
Ohio:				New Orleans	1	1	0
Cincinnati	0	1	0	Oklahoma:			
Cleveland	1	1	0	Tulsa	0	0	1
Indiana:				California:			
Indianapolis	1	1	0	Sacramento	1	0	0

Lethargic encephalitis.—Cases: Washington, D.C., 1.
Pellagra.—Cases: Charleston, S.C., 3; Savannah, 1; Memphis, 1; Montgomery, 1; New Orleans, 2; Shreveport, 1.
Typhus fever.—Cases: New York, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—Two weeks ended June 17, 1933.—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the 2 weeks ended June 17, 1933, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis	1		1	3	2					7
Chicken pox		29	4	272	539	67	109	46	152	1,218
Diphtheria		2	1	26	9	8	3	1	3	53
Erysipelas				7	3				6	16
Influenza		27		5	2	1	17		51	103
Measles		2	13	394	219	3	4	2	95	732
Mumps		1			238	48	6		53	346
Paratyphoid fever					4			1		5
Pneumonia		7			6		12		9	34
Poliomyelitis				5	2	1				8
Scarlet fever		5	7	78	140	16	21	7	46	320
Smallpox							6			6
Trachoma							1		35	36
Tuberculosis	1	2	17	106	61	17	92	1	30	327
Typhoid fever		1	3	36	15	5	3		3	66
Undulant fever					5				1	6
Whooping cough		10		167	240	93	16	7	47	580

CUBA

Habana—Communicable diseases—Four weeks ended June 17, 1933.—During the 4 weeks ended June 17, 1933, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	5	1	Rabies	1	1
Leprosy	2	1	Tuberculosis	20	
Malaria	6		Typhoid fever	7	5

Provinces—Communicable diseases—Four weeks ended May 27, 1933.—During the 4 weeks ended May 27, 1933, cases of certain communicable diseases were reported in the provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Chicken pox		6		1	6	4	17
Diphtheria		7		1	1	2	11
Malaria		13	13	34	6	3	69
Measles		4		8	9	4	25
Scarlet fever		3					3
Tuberculosis		22	33	31	34	30	150
Typhoid fever	6	12	2	22	11	14	67

GREAT BRITAIN

England and Wales—Vital statistics—January-March 1933.—During the first quarter of the year 1933, 148,675 births and 170,002 deaths were registered in England and Wales. The following statistics are taken from the Quarterly Return of Births, Deaths, and Marriages, issued by the Registrar-General of England and Wales. The figures are provisional.

Birth and death rates in England and Wales, January to March 1933

Annual rates per 1,000 population:	
Live births	15.0
Stillbirths	.67
Deaths, all causes	17.2
Deaths from—	
Diphtheria	0 6
Influenza	2 03
Measles	.06
Scarlet fever	.02
Annual rates per 1,000 population—Contd.	
Deaths from—Continued.	
Typhoid and paratyphoid fever	0.00
Violence	.54
Whooping cough	.10
Deaths per 1,000 live births:	
Diarrhea and enteritis (under 2 years)	5.7
Total deaths under 1 year	84.0

England and Wales—Infectious diseases—Thirteen weeks ended April 1, 1933.—During the 13 weeks ended April 1, 1933, cases of certain infectious diseases were reported in England and Wales as follows:

Disease	Cases	Disease	Cases
Diphtheria	10,242	Puerperal pyrexia	1,632
Ophthalmia neonatorum	1,034	Scarlet fever	23,358
Pneumonia	34,120	Smallpox	228
Puerperal fever	505	Typhoid fever	214

PUERTO RICO

Communicable diseases—Four weeks ended June 17, 1933.—During the 4 weeks ended June 17, 1933, cases of certain communicable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chicken pox	67	Paratyphoid fever	2
Diphtheria	37	Pellagra	4
Dysentery	214	Syphilis	17
Erysipelas	5	Tetanus	11
Filariasis	5	Tetanus, infantile	3
Influenza	63	Trachoma	6
Malaria	1,791	Tuberculosis	404
Measles	180	Typhoid fever	61
Mumps	50	Whooping cough	127
Ophthalmia neonatorum	6		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for June 30, 1933, pp. 776-786. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued July 28, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Philippine Islands.—During the week ended July 1, 1933, cholera was reported in the Philippine Islands as follows: Province of Cebu,

Santa Fe, 2 cases, 2 deaths; Province of Occidental Negros, San Carlos, 5 cases, 6 deaths.

India.—During the week ended June 24, 1933, cholera was reported in certain cities in India as follows: Bombay, 1 case; Rangoon, 1 case and 1 death.

Plague

India.—During the week ended June 24, 1933, 1 case of plague with 1 death was reported at Rangoon, India.

Iraq.—During the week ended June 24, 1933, 1 case of plague was reported at Baghdad, Iraq.

Typhus Fever

Egypt.—During the week ended June 24, 1933, Alexandria, Egypt, reported 3 cases of typhus fever with 2 deaths from the same cause.

Yellow Fever

Ivory Coast.—Under date of June 21, 1933, 1 case of yellow fever was reported at Buafle, and on June 16, 1933, a fatal suspected case was reported at Gagnoa.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

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JULY 21 - - - 1933

IN THIS ISSUE

Rocky Mountain Spotted Fever and Typhus of Sao Paulo
The Heating of Animal Tissues by High Frequency Fields
Deaths in Large Cities During the Week Ended July 1
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of public health.

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PUBLIC HEALTH REPORTS

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FURTHER STUDIES ON THE RELATIONSHIP OF THE VIRUSES OF ROCKY MOUNTAIN SPOTTED FEVER AND SAO PAULO EXANTHEMATIC TYPHUS[1]

By R. R. PARKER, *Special Expert*, and GORDON E. DAVIS, *Bacteriologist, United States Public Health Service*

In a recent paper [2] the writers presented data which showed that sera of guinea pigs and rabbits recently recovered from Sao Paulo exanthematic typhus had a high degree of protective value against Rocky Mountain spotted fever serum-virus. These results suggested a close relationship between the two viruses. Other studies correlated thereto have since been made, in which a strain of the Sao Paulo disease was used that had been established in guinea pigs from infected ticks of the species *Amblyomma cajennense.* These had been very kindly forwarded to us by Dr. J. L. Monteiro, of the Instituto Butantan, Sao Paulo, Brazil. Part of these experiments are reported herein as follows: (1) Tests to determine the protective value of sera of animals recovered from Rocky Mountain spotted fever against Sao Paulo exanthematic typhus serum-virus and (2) cross-immunity tests using guinea pigs recovered from Rocky Mountain spotted fever and Sao Paulo exanthematic typhus citrated whole-blood virus. The resultant data afford further evidence of the close relationship of the two diseases.

MATERIALS AND TECHNIQUE

Protection tests.—The procedure followed in testing the protective value of Rocky Mountain spotted fever convalescent sera against Sao Paulo serum-virus was the same as that employed in making similar tests in the opposite direction.

Four samples of Rocky Mountain spotted fever convalescent sera were employed. No. 1 was taken the fourth day, no. 2 the fifth day, no. 3 the sixth day, and no. 4 the eighth day after the last day of

[1] Contribution from the Rocky Mountain Spotted Fever Laboratory of the U.S. Public Health Service at Hamilton, Mont.

[2] Parker, R. R., and Davis, Gordon E.: Protective Value of Convalescent Sera of Sao Paulo Exanthematic Typhus Against Virus of Rocky Mountain Spotted Fever. Pub. Health Rep., vol. 48, no. 19, May 12, 1933, pp. 501-507.

fever The first three samples were pooled sera from several guinea pigs From each serum duplicate series of three mixtures with Sao Paulo guinea pig serum-virus no. 291 were prepared The mixtures of each series all contained 0.5 cc of the test serum and 0.1 cc, 0.25 cc, and 0.5 cc, respectively, of the serum-virus. These six mixtures, after standing one half hour at room temperature, were injected intraperitoneally into separate guinea pigs. Sao Paulo serum-virus control guinea pigs were injected intraperitoneally as follows: six received 0.1 cc each, six 0.25 cc, and six 0.5 cc. This serum-virus was from heart blood drawn from 2-passage virus animals on the second day of fever, and was shown infectious to a one two-hundred-and-fiftieth part of a cubic centimeter.

The test guinea pigs that remained afebrile were observed for a period of 15 days; those that showed fever were observed for a longer period, if necessary. The serum-virus controls were observed until death occurred or recovery was assured.

Only male guinea pigs were used for both this experiment and the one described in the following:

Cross-immunity tests.—Twelve guinea pigs recovered from Rocky Mountain spotted fever for a period of approximately 8 months were used. Six were injected intraperitoneally with 1 cc of Sao Paulo whole-blood passage virus no. 288. The other six each received 1 cc of similar Rocky Mountain spotted fever passage virus no. 287. Each of these lots of virus contained one-fifth part of physiological salt solution with 2 percent sodium citrate. These animals were observed over a period of 13 days.

As virus control animals, two guinea pigs each received 1 cc of the citrated Sao Paulo virus and four received 1 cc of the citrated spotted fever virus.

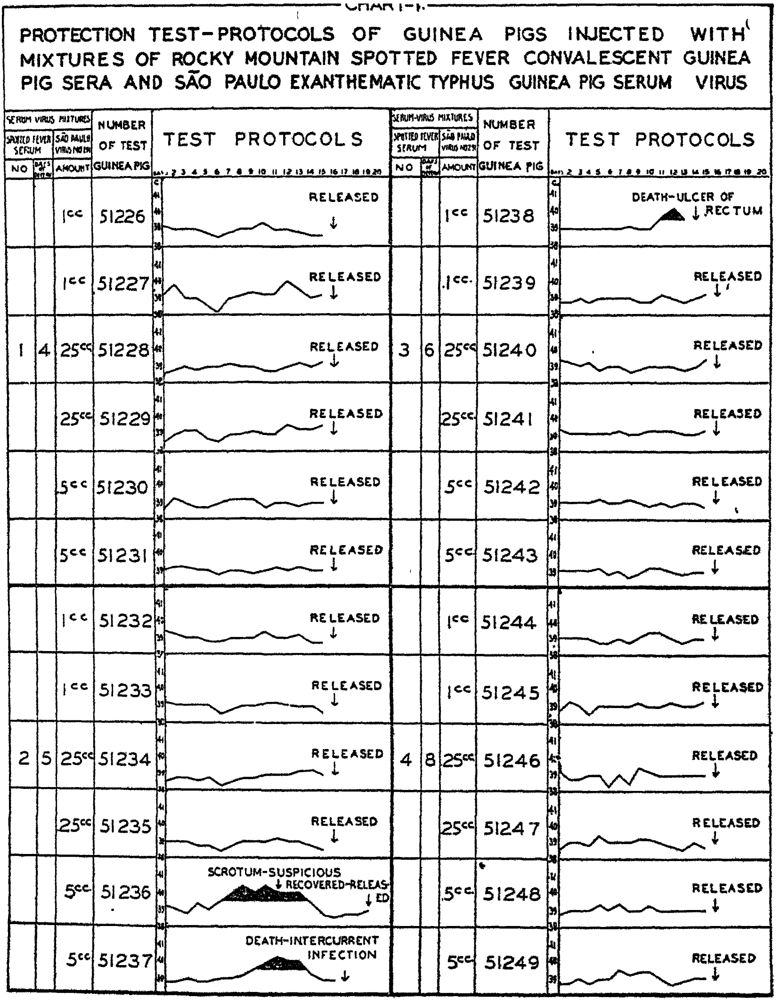
Rocky Mountain spotted fever virus no. 287 consisted of the pooled citrated heart blood from passage guinea pigs of three highly virulent strains, all of which cause the death of over 90 percent of inoculated guinea pigs.

RESULTS

Protection tests.—Protocols of the protection tests are shown graphically in chart 1. All four samples of convalescent Rocky Mountain spotted fever guinea pig serum showed high protective value. The 0.5 cc units of 3 of the sera (nos. 1, 3, and 4) fully protected the test animals against all 3 amounts of the Sao Paulo virus, and serum no. 2 fully protected those animals that received mixtures containing 0.1 cc and 0.25 cc of serum-virus. One of the animals receiving serum no. 3 that received 0.1 cc of serum-virus, and one receiving serum no. 2 that received 0.5 cc of the virus died of intercurrent disease conditions. The second guinea pig given serum no. 2 that received 0.5 cc of Sao Paulo virus showed fever from the sixth

to the fourteenth day and a swollen, suspicious scrotum beginning the eleventh day. This reaction was probably due to Sao Paulo typhus infection; however, the animal concerned was but slightly ill.

All of the 18 control guinea pigs receiving Sao Paulo serum-virus no. 291 showed fever and scrotal lesions typical or suggestive of Sao



Paulo typhus (see chart 2), as we have observed it in several hundred guinea pigs. Of the 3 groups of 6 guinea pigs each that received 0.1 cc, 0.25 cc, and 0.5 cc, respectively, of serum-virus, 4 of each group succumbed. Necropsies were performed on all the latter animals and in each instance the gross appearance of the spleen and genital tissues was characteristic. The spleen was enlarged from 3 to 5 times, was relatively smooth, and of a deep red color; a slight surface exudate

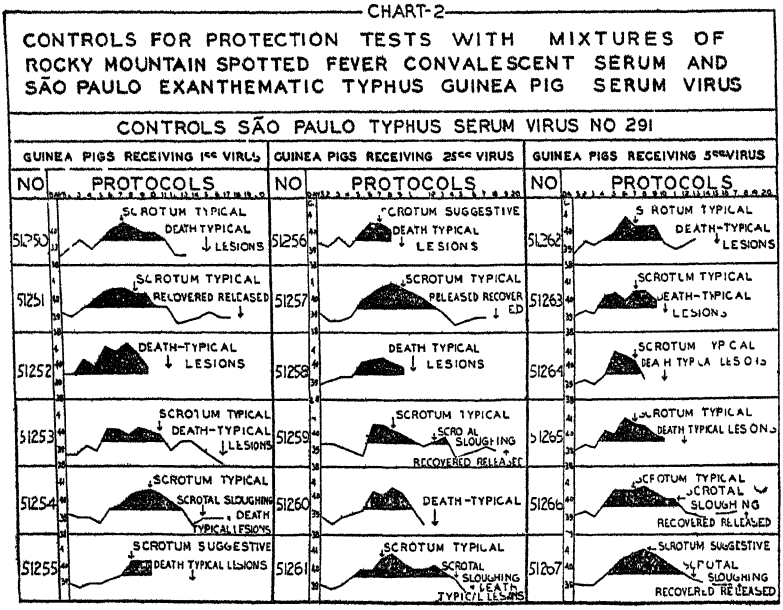


CHART-2
CONTROLS FOR PROTECTION TESTS WITH MIXTURES OF ROCKY MOUNTAIN SPOTTED FEVER CONVALESCENT SERUM AND SÃO PAULO EXANTHEMATIC TYPHUS GUINEA PIG SERUM VIRUS
CONTROLS SÃO PAULO TYPHUS SERUM VIRUS NO 291
GUINEA PIGS RECEIVING 1cc VIRUS
GUINEA PIGS RECEIVING 2.5cc VIRUS
GUINEA PIGS RECEIVING 5cc VIRUS
NO
PROTOCOLS
51250
SCROTUM TYPICAL
DEATH TYPICAL LESIONS
51251
SCROTUM TYPICAL
RECOVERED RELEASED
51252
DEATH-TYPICAL LESIONS
51253
SCROTUM TYPICAL
DEATH-TYPICAL LESIONS
51254
SCROTUM TYPICAL
SCROTAL SLOUGHING
DEATH TYPICAL LESIONS
51255
SCROTUM SUGGESTIVE
DEATH TYPICAL LESIONS
51256
SCROTUM SUGGESTIVE
DEATH TYPICAL LESIONS
51257
SCROTUM TYPICAL
RELEASED RECOVERED
51258
DEATH TYPICAL LESIONS
51259
SCROTUM TYPICAL
SCROTAL SLOUGHING
RECOVERED RELEASED
51260
DEATH-TYPICAL
51261
SCROTUM TYPICAL
SCROTAL SLOUGHING
DEATH TYPICAL LESIONS
51262
SCROTUM TYPICAL
DEATH-TYPICAL LESIONS
51263
SCROTUM TYPICAL
DEATH-TYPICAL LESIONS
51264
SCROTUM TYPICAL
DEATH TYPICAL LESIONS
51265
SCROTUM TYPICAL
DEATH TYPICAL LESIONS
51266
SCROTUM TYPICAL
SCROTAL SLOUGHING
RECOVERED RELEASED
51267
SCROTUM SUGGESTIVE
SCROTAL SLOUGHING
RECOVERED RELEASED

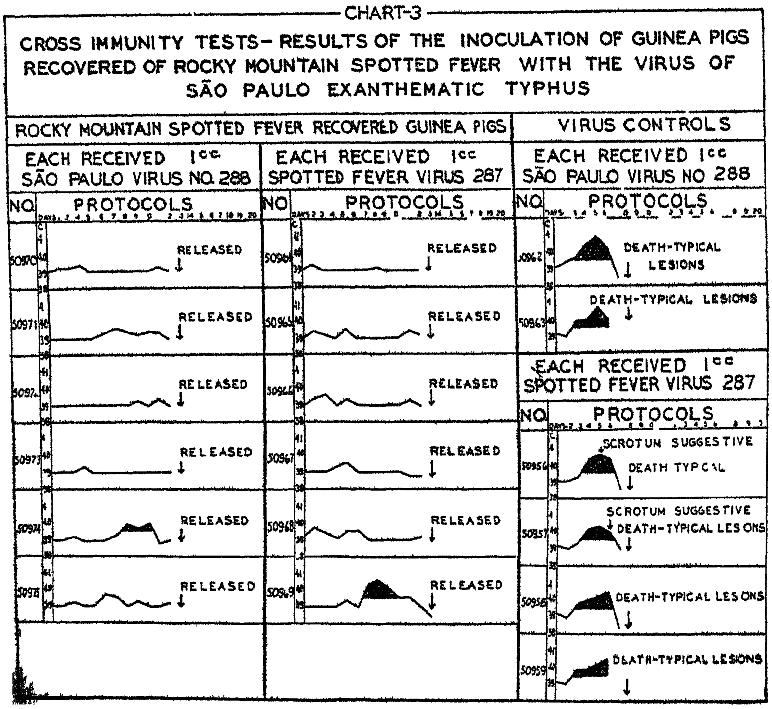


CHART-3
CROSS IMMUNITY TESTS- RESULTS OF THE INOCULATION OF GUINEA PIGS RECOVERED OF ROCKY MOUNTAIN SPOTTED FEVER WITH THE VIRUS OF SÃO PAULO EXANTHEMATIC TYPHUS
ROCKY MOUNTAIN SPOTTED FEVER RECOVERED GUINEA PIGS
VIRUS CONTROLS
EACH RECEIVED 1cc SÃO PAULO VIRUS NO. 288
EACH RECEIVED 1cc SPOTTED FEVER VIRUS 287
EACH RECEIVED 1cc SÃO PAULO VIRUS NO 288
NO
PROTOCOLS
RELEASED
DEATH-TYPICAL LESIONS
EACH RECEIVED 1cc SPOTTED FEVER VIRUS 287
SCROTUM SUGGESTIVE
DEATH TYPICAL
DEATH-TYPICAL LESIONS

was observed in a few animals. The testes were injected in greater or less degree and the visceral and parietal laminae of the tunica vaginalis were partially or completely adherent. The gross appearance was not essentially different from that of Rocky Mountain spotted fever.

Cross-immunity tests (chart 3).—All of the six 8-months-recovered Rocky Mountain spotted fever guinea pigs which were inoculated with Sao Paulo virus no. 288, remained afebrile during the 13-day observation period, with the exception of 1 guinea pig which had low fever from the seventh to the tenth day. The cause of the febrile reaction was not apparent and may or may not have been a reaction to the Sao Paulo virus.

Of 6 additional guinea pigs that were inoculated with spotted fever virus no. 287, 5 remained afebrile, the sixth showing a febrile reaction from the seventh to the eleventh day. As in the case of the guinea pig in the first series, the cause of the reaction was not apparent.

Both of the control animals that received Sao Paulo virus no. 288 died on the seventh day. Neither animal showed suggestive scrotal lesions, but the gross appearance of the tissues was indicative of Sao Paulo exanthematic typhus.

All four control animals receiving spotted fever virus no. 287 also died on the seventh day. Only two showed suggestive scrotal swelling, but necropsy findings of all were typical.

DISCUSSION

The tests here described show that the sera of guinea pigs recovered from Rocky Mountain spotted fever have a degree of protective value against Sao Paulo exanthematic typhus virus that is essentially specific, and that guinea pigs recovered from Rocky Mountain spotted fever have as high degree of immunity against Sao Paulo typhus virus as they have against that of spotted fever. Thus far only two tests have been made to determine the degree of immunity of Sao Paulo typhus-recovered guinea pigs to Rocky Mountain spotted fever. In both instances the guinea pigs remained afebrile.

These data, together with our previous findings, suggest that Sao Paulo exanthematic typhus and Rocky Mountain spotted fever are immunologically identical.

HEATING EFFECT OF VERY HIGH FREQUENCY CONDENSER FIELDS ON ORGANIC FLUIDS AND TISSUES

By J. W. Schereschewsky, *Medical Director, United States Public Health Service; Medical Officer in Charge, Cancer Investigations*

In recent years the investigation of the biological effects of high-frequency condenser fields has attracted no little interest on the part of research workers. On this continent Christie and Loomis (2), Hosmer (3), Carpenter and Page (1), McLennan and Burton (4), the writer (7), (8), (9), and in Europe Schliephake and Patzold, among others both here and abroad, have studied the action of the high-frequency condenser field, both upon biological material and upon solutions of electrolytes and have demonstrated the powerful heating action exerted upon experimental material placed in such fields.

The extent of the heating of biological material in high-frequency condenser fields is related both to the dielectric constant and to the conductivity of the material. The interesting phenomenon of the relation of conductivity to heating effect was first noted by Dr. W. R. Whitney, director of the research laboratory of the General Electric Co., in connection with test runs of a 20-kilowatt short-wave oscillator, during which it was observed that solutions of electrolytes of different concentrations, when placed in the high-frequency condenser field of the oscillator, did not heat alike, one concentration heating faster than another at one frequency, while this relation might be reversed if the frequency were sufficiently changed.

This heating of electrolytes in high-frequency condenser fields was first investigated by Hosmer (2) and then, among others, by Richards and Loomis, McLennan and Burton, and in Europe, by Patzold.

It is to the studies of McLennan and Burton on the heating of electrolytes in such fields and of the physical relations involved that we owe a better understanding of the process as applied both to electrolytes and to biological specimens.

The main facts of their inquiry summarized by them are as follows: The degree of heating of a solution of electrolyte in a high-frequency condenser field depends, not upon the composition, but on the specific conductivity, and, at a given frequency, is a maximum for a certain conductivity, whatever the size and shape of the specimen heated.

They derived a simple mathematical relation whereby the conductivity at which, for any given frequency, maximum heating occurs may be readily computed. At any given frequency the specific conductivity of the solution showing the maximum heating effect is such that $K=\frac{\nu\epsilon}{2}$, where K is the conductivity, measured in absolute units, ν is the frequency, and ϵ the dielectric constant of the specimen.

From this it follows that the conductivity at which the maximum effect occurs is proportional to the frequency, i.e., at lower frequencies the maximum heating is observed in solutions of lower concentrations than at higher frequencies. For example, at 1,560,000 cycles the concentration of a solution of potassium chloride showing the maximum heating effect is 0.00038 gram-molecules per liter; at 5,560,000 cycles it is 0.002 gram-molecules, or rather more than 5 times greater; at 22,000,000 cycles the concentration is about 0.005; at 26,000,000 cycles it is about 0.01, while, from personal observations, at 300,000,000 cycles, it is nearly 0.1.

This heating of electrolytes in high frequency fields has an important bearing upon the extent to which biological specimens are heated when placed in such fields. If we take a heterogeneous specimen, such as the body of a laboratory animal, and place it in a condenser field, excited at some particular frequency, the distribution of the field intensity within the body will be governed largely by the respective dielectric constants of the component tissues, the degree of heating at any particular frequency by their respective conductivities.

McLennan and Burton point out, moreover, that if the electrical properties of the component tissues of the body were known, we should, by proper choice of frequency, be able to favor the heating of one portion over the other, although heat exchange between adjacent sections would tend to minimize the effect of such selective heating. Nevertheless, they suggest a therapeutic possibility which, if susceptible of development, would have wide application.

In this country, apparatus for the induction of artificial fever through exposure to high frequency fields, the so-called "radiotherm", has been designed to operate at a frequency of about 10,000,000 cycles per second, or at a wave-length of 30 meters. In Germany therapeutic apparatus has been constructed to operate at the considerably higher frequencies of 50,000,000 to 60,000,000 cycles per second, but is adapted only to local heating effects.

Because of the relatively high concentrations of electrolyte in body tissues and fluids, and the relation, worked out by McLennan and Burton, which exists respectively between the dielectric constant, the conductivity, and the frequency at which maximum heating is observed, it would appear that, where selective heating effects for therapeutic purposes are desired, these conditions would be more nearly approached by the use of higher frequency ranges than those previously employed.

Up to the last 3 years or so, investigations of the biological effects of high-frequency fields, in the range of frequencies above 130,000,000 to 150,000,000 cycles, have seemed impracticable, because of the lack of generators with substantial power output in this range of frequencies.

However, the development by the General Electric Co. of the so-called "Magnetron" vacuum tube and the associated oscillating circuit has provided a means for the generation of high-frequency oscillations of sufficient energy for biological investigations at any desired frequency up to about 400,000,000 cycles per second, corresponding to a wave-length of 75 centimeters.

This paper accordingly reports the comparative heating effects observed in high-frequency condenser fields on a considerable number

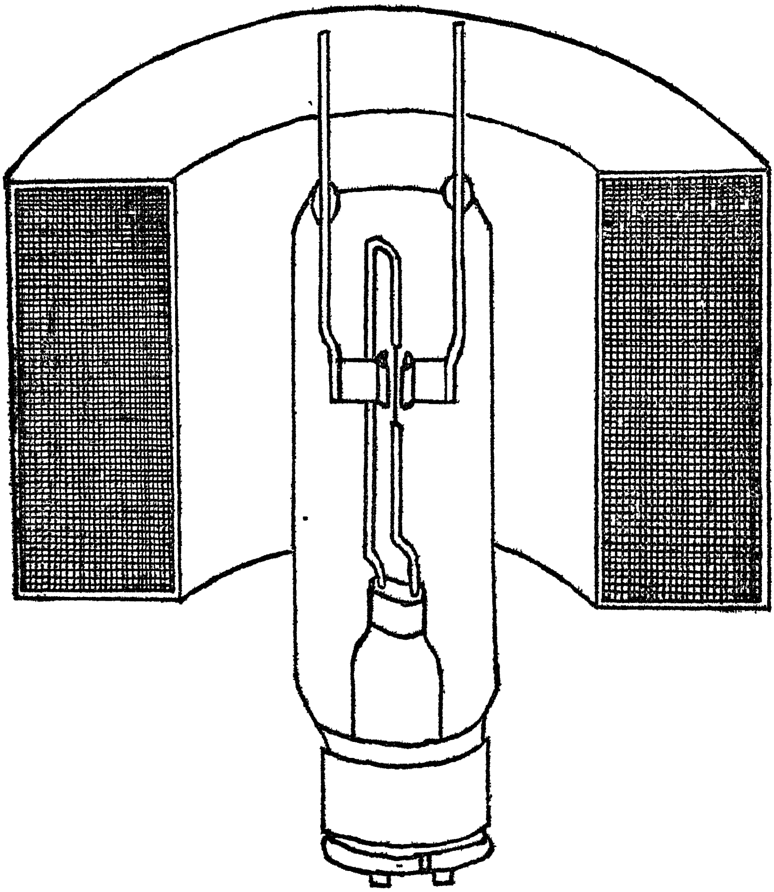


FIGURE 1.—General appearance of Magnetron tube (FH-11)

of biological fluids and tissues in a range of frequencies extending from 64,000,000 to 300,000,000 cycles per second An attempt was also made to gain some idea of the dielectric constants of various body tissues in this range of frequencies.

The Magnetron oscillator.—The Magnetron tube and associated circuit used in carrying out these experiments are described in "Instructions GEJ-239", issued by the General Electric Co. The

tube (Magnetron FH-11) is a high-vacuum tube with a vertical, spiral, tungsten filament. On either side of the filament are two semicylindrical anodes separated, before and behind, by equal longitudinal spaces. The heavy supporting leads of the anodes are extended through the top of the tube and serve as external connections to the circuit. Figure 1 gives an idea of the general appearance of the tube, which has a maximum anode dissipation of energy of 60 watts.

The tube, when employed as a high-frequency generator, is used with the appropriate circuit in conjunction with a polarizing magnetic field. This field, in the center of which the tube is mounted, is furnished by a large "doughnut" coil 5 inches thick, having outside and inside diameters of 11 and 5 inches, respectively, and consisting of approximately 2,700 turns of no. 14 enameled copper wire. When energized by a 110-volt direct current, the field strength is varied by means of a sliding contact resistance in series with the coil from about 600 gausses, the required field strength for a wave length of 75 cm up to 800 gausses, the field strength required for wave lengths of 5 meters or more.

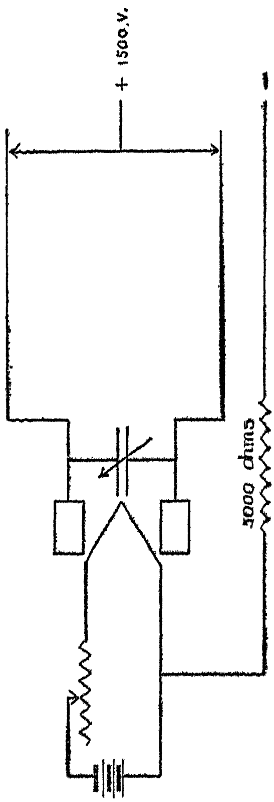


FIGURE 2.—Diagram of oscillatory circuit used with Magnetron tube.

Figure 2 is a diagram of the oscillatory circuit used with the tube. It will be noted that the anode voltage is applied to the midpoint of the inductance connected across the anode leads. For frequencies in excess of about 80,000,000 cycles, the interelectrode capacity of the tube is enough for the generation of oscillations. For the lower range of frequencies, additional capacity must be connected across these leads. In the form of oscillator worked out at this laboratory, a rack and pinion, mounted at the rear of the polarizing coil, operates a trombone-slide arrangement of rods within brass tubes, thus permitting the frequency to be varied within the limits of the sliding adjustment. The range of frequencies can be changed by unscrewing one tube-and-rod combination and substituting another of different length. Demountable disk condensers, making contact with the anode leads through phosphor-bronze springs, furnished additional variable capacity, as required. A 5,000-ohm fixed resis-

tance with a current capacity of 250 to 300 milliamperes, mounted in the anode-return lead, is required for stable operation.

Figure 3 shows the appearance of the oscillator when adjusted for a wave length of 5 meters. The frequency at which the oscillator was working was determined by means of a Lecher wire system mounted behind and in the neighborhood of the oscillator. The oscillator proved very satisfactory, for it operated with steadiness and without preliminary coaxing at any frequency for which it was set.

EXPERIMENTAL

With the oscillator just described, a study of the comparative heating effects of high frequency condenser fields was carried out on a variety of organic tissues and fluids. These were as follows: Serum, plasma, whole blood (heparinized), washed red cells, liver, spleen, heart muscle, skeletal muscle, kidney, pancreas, brain, and lung. The observations were carried out at eight different frequencies, i.e., 64,000,000, 80,000,000, 100,000,000, 125,000,000, 156,000,000, 195,000,000, 242,000,000 and 300,000,000 cycles per second. It will be observed that each frequency differs from the next lower by 25 percent.

The various specimens exposed to the action of the high-frequency fields were uniformly 5 cc in volume. They were placed in a double-walled cylindrical container of pyrex glass (fig. 5) holding about 9 cc and resembling a miniature thermos flask minus the internal metallic coating. The space between the walls was exhausted to a high vacuum. The vessel containing the specimen to be tested was mounted by means of the tubulation at the lower end through which it had been exhausted in a holder between two condenser plates having a similar curvature, but separated by an air space from the vessel in an auxiliary coupled circuit, carefully tuned to the oscillator frequency. This inductively coupled circuit was formed of the condenser plates mentioned above, the vessel containing the specimen and a loop formed by equal arcs of heavy wire, connecting the condenser plates with the terminals of a thermal ammeter which, in this manner, was symmetrically inserted in the circuit. A scratch mark on the vessel insured its orientation in the same position with respect to the field when replaced after removal for changing specimens.

The mercury thermometer for measuring the rise in temperature was calibrated by comparison with an Anschütz thermometer with Bureau of Standards certificate.

The thermometer was so placed in the specimen that the bulb occupied the central portion, the distance from the upper and lower ends of the bulb to the surface and bottom, respectively, being the same. The thermometer was inserted through a well-fitting cork,

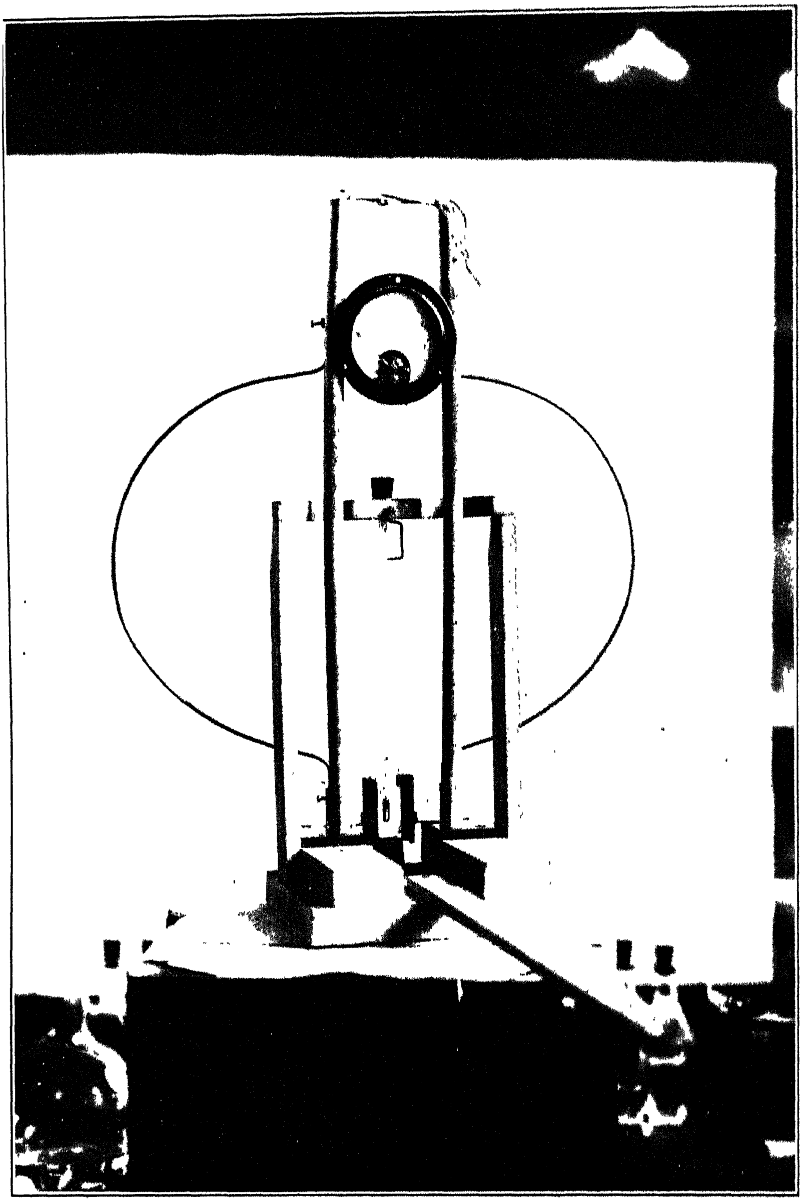


FIGURE 3.—Magnetron oscillator adjusted for a frequency of 60×10^6 cycles (wave length, 5 meters).

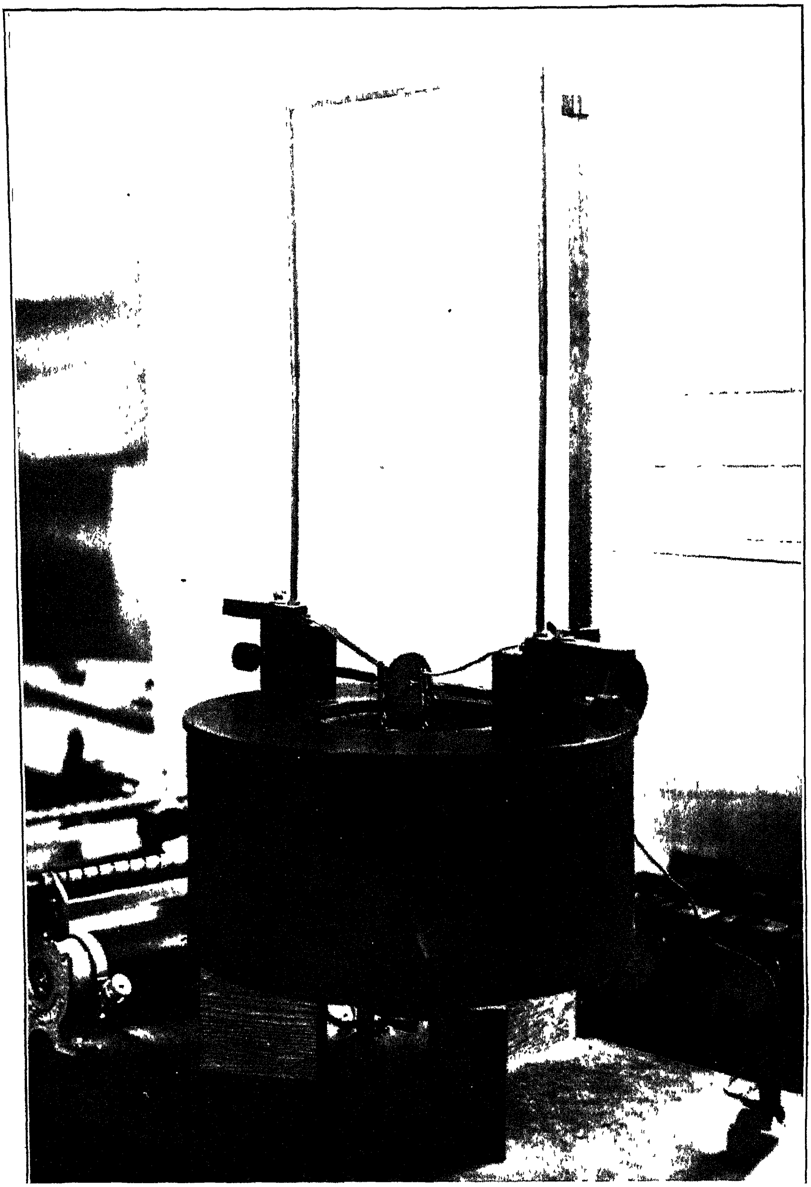


FIGURE 4.—Auxiliary coupled circuit adjusted for a frequency of 10^8 cycles.

fitted in turn to a hole in a horizontal support about 17 cm above the upper edge of the vessel. A sharp-pointed indicator was mounted on the thermometer support so that by bringing it exactly upon a selected degree of the thermometer scale, a constant depth of immersion of the bulb in the specimen was insured. Great care was taken to orient the thermometer in the vertical axis of the specimen as well as to secure constant depth of immersion. The use of a mercury thermometer as a measuring device was permissible, as the high-frequency field does not heat metallic substances.

By paying careful attention to the tuning of the coupled circuit to the oscillator frequency, relatively loose coupling could be employed, thus preventing changes in the frequency of the oscillator through mutual reaction of the two circuits. A long wooden handle attached to the base of the support for the auxiliary circuit permitted the observer, by means of slight changes in the coupling, to keep the needle of the meter in the coupled circuit always upon the selected division of the meter scale. In practice it was found easy to keep the meter needle upon the selected point with an accuracy of ±0.1 of a division. As the main divisions on the meters used were graduated in twentieths, the current indication could be kept constant to one part in 200.

All tuning adjustments with respect to both circuits were made with the coupled circuit in proper inductive relation to the oscillator. The frequency was also repeatedly checked during runs. The general appearance of the auxiliary coupled circuit, adjusted for a frequency of 100,000,000 cycles, is shown in figure 4.

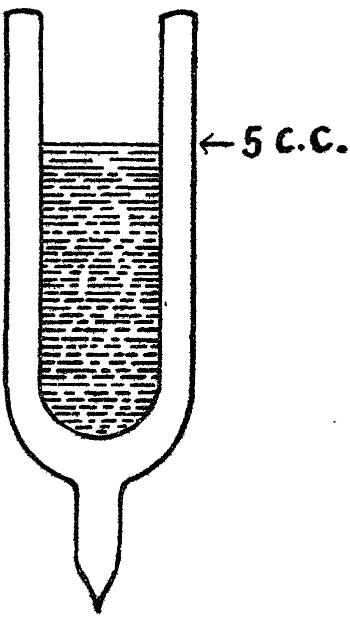


FIGURE 5.—Cross section of double-walled specimen container

The organic tissues and fluids used in these studies were derived from dogs, as they were at hand in sufficient numbers. After being anesthetized, the animals were exsanguinated through a canula in the carotid artery. A portion of the first blood was received into a cylinder containing sufficient heparin to prevent coagulation. This served as a source of material for tests on whole blood, plasma, and corpuscles. The remainder was received into a jar, covered hermetically (to prevent evaporation), and served as a source of blood serum after clotting had occurred. The various organs as they were

removed were received in large ointment jars of opal glass, with tight-fitting screw lids. All tissues and fluids, except when being tested, were kept at 4° C. This was necessary as it was usually impracticable to prepare the specimens and finish the runs on any one working day. The fluids (serum, plasma, whole blood, washed red cells) were measured out into the vessel by means of a calibrated pipette. The equivalent amount of the solid tissues was determined in the manner here described. A condition which had to be met was the requirement that the various specimens should all occupy the same *volume* in the high frequency condenser field, which was necessary if the energy density of the field was to be comparable per unit of volume. Since the specific gravity of the various organs is different, preliminary specific gravity determinations were necessary. These were secured with sufficient accuracy for the purpose by preparing a series of salt solutions differing in concentration from each other by 1 percent and taking the specific gravity of each at 20° C. (laboratory temperature) with a Westphal specific gravity balance. The specific gravity of the various organs was determined by dropping small bits in a series of the salt solutions, noting whether the tissue sank, floated, or was indifferent. This observation had to be made within the first few seconds, as of course water was rapidly extracted by the highly hypertonic solutions. However, this method proved adequate for the purpose, any error being in the direction of assigning a slightly higher rather than a lower specific gravity. Since the specimens were weighed out, such error, if any, would tend to make the bulk of the specimen more, rather than less, than 5 cc and thus diminish the energy density through the specimen. The following specific-gravity values were found to be practically constant for the whole series of animals:

Liver, spleen, pancreas, and skeletal muscle 1.07; kidney and heart muscle 1.06; brain 1.055; testicle 1.035; lung 0.94 (since lung was lighter than water, its specific gravity determination was carried out in alcohol-water mixtures for which there are extended specific gravity tables).

It will be noted that, since the tissues were removed from exsanguinated animals, they contained a much reduced quantity of blood. A special technique would, of course, have been required to produce completely exsanguinated tissues. The tissues, before being exposed to the action of the high frequency field, were first run through a meat grinder, and then the amount equivalent to 5 cc (as determined by the specific gravity) was weighed out on scales sensitive to 1 mg. The tissue was then introduced into the vessel, care being taken to pack the tissue homogeneously and to exclude air bubbles.

The usual order of procedure at any frequency was to make the heating determinations on the whole blood, then upon plasma and

red corpuscles, the determination upon blood serum being postponed until the following day so as to permit the complete separation of the serum from the clot. Red blood cells were washed free from plasma by three consecutive centrifugalizations, the red cell suspension being about 95 percent red blood cells. The washing was conducted with physiological (0.8 percent) salt solution. It will be noted that an 0.8 percent salt solution has a molar concentration (for sodium chloride) equivalent to approximately somewhat less than a one-seventh normal solution; and so the frequency at which maximum heating would take place for a solution of this concentration would, for a solution of KCl, be in the neighborhood (at 28° C.) of 435,000,000 cycles per second, or a wave-length of about 69 cm—a frequency well beyond the range of the oscillator. In this connection trials were made of isotonic non-electrolyte solutions in which to suspend the red cells. A 3 percent solution of glucose was found to be practically isotonic with red cells, and trial of this solution as a means of suspension was made. However, its use was abandoned because red cells settled very poorly on centrifugalization on account of the relatively high specific gravity of the glucose solution. On trial, the degree of heating of physiological salt solutions, when placed in the high frequency field, was found to be low, considerably lower than that of blood serum even at the highest frequencies studied. This was, accordingly, the medium used for suspending the red cells.

Table 1 gives the results obtained in the range of frequencies mentioned above. In this table the degree of heating observed in blood serum is set down as 100, and the heating observed in all the other tissues and fluids is compared therewith.

TABLE 1.—*The relative heating in high-frequency fields of various body fluids and tissues*

Frequency	Wave-length	Serum	Whole blood	Red cells	Plasma	Liver	Spleen	Heart muscle	Temporal muscle	Kidney	Brain	Pancreas	Lung
	Meters												
3×10^8	1.0	100.0	116.2	124.0	105	122	116.2	109	110	116	145	142	157
2.42×10^8	1.24	100.0	122.5	137.0	102	128	125.9	111.0	107	120.5	146	149	145
1.95×10^8	1.54	100.0	124.7	149.7	96	137	129	119.5	110.5	119.5	143	152	157.5
1.55×10^8	1.93	100.0	154.0	161.0	115	162	150	151.0	143.0	142.0	165	153	181
1.25×10^8	2.40	100.0	123.5	163.0	105	170	163.5	154.0	149	132.0	176	217	185
1.0×10^8	3.00	100.0	147.0	177.0	105	184	162.0	146.0	146	158.5	176.5	177.5	190
8×10^7	3.75	100.0	157.0	171.0	100	184	179	156.0	157	172.0	199	207	208
6.4×10^7	4.69	100.0	151.0	192.0	110	215	192	170.0	162	173.0	234	199	199

From inspection of the table the following points are evident:

First, that all the body tissues and fluids show a greater degree of heating in the high-frequency field than does blood serum; that plasma, as might be expected, shows but little different heating qualities from those of blood serum, but, on the whole, except at one frequency

(195,000,000 cycles), tends to heat more. Whole blood heats considerably more than serum, the maximum difference being at 80,000,000 cycles, the minimum at 300,000,000. Red cells generally heat much more than either plasma or serum, the maximum effect being noted at 64,000,000 cycles, at which frequency the heating of red cells was nearly twice that of blood serum. At the two highest frequencies, 242,000,000 and 300,000,000 cycles, the differences between the heating effect of the various tissues and fluids tended to be ironed out, all the organs, and fluids, with the exception of brain, pancreas, and lung, showing only moderate heating in excess of that displayed by blood serum. Liver, brain, pancreas, and lung are conspicuously well heated by the high-frequency field. The maximum effect on liver and brain compared with blood serum was observed at 64,000,000 cycles, that on pancreas at 125,000,000 cycles, on lung at 80,000,000 cycles. Kidney, on the whole, heated less than the other viscera tested, the general degree of heating observed being about the same as that of heart muscle and skeletal muscle, which tissues resemble each other in heating characteristics.

One of the inferences to be drawn from the table is that the higher the frequency at which the field is excited, the more nearly uniform is the comparative extent to which the various tissues and fluids are heated, although brain, pancreas, and lung continue to retain their high relative heating. The use of any such frequency as 300,000,000 cycles for therapeutic purposes, however, although such frequency would tend to produce rapid and more nearly uniform heating of all exposed tissues, is, of course, out of the question, not only because of the lack of any apparatus capable of substantial output at this frequency but also because of the impracticability from physical considerations of devising any circuit for specimens of considerable size, such as the human body or even portions thererof, larger, say, than 10 or 15 cc, which could be resonated with a generator operating at this frequency. The only possibility, and that rather remote, would be the discovery of a generator capable of operating at such frequency with an output so great that current flow by means of "shock-excitatation" could be caused in objects placed in the field even if the natural period of such circuit was far below that of the generator.

However, at the lower frequencies considerable differential heating in some of the organs was manifest. Frequencies of the order of, say, 50,000,000 to 60,000,000 cycles, are not too high to exclude their use for therapeutic purposes, especially for heating portions of the human anatomy.

For example, as previously mentioned, apparatus has been developed in Germany, operating at a frequency of 50,000,000 to 60,000,000 cycles, which is adapted to the treatment of portions of the body, such as the thigh, a knee, or a shoulder joint, and might even be used for

thoracic treatment. Schliephake (11), in Germany, has made use of frequencies, for therapeutic purposes, of between 15,000,000 and 100,000,000 cycles per second. His general conclusions from clinical observations in staphylococcus infections were that the most rapid curative effects were obtained at frequencies of from 60,000,000 to 100,000,000 cycles. He had the impression that in the 35,000,000 to 30,000,000 range there was a zone in which a favorable outcome required a much longer time. At a frequency range of from 25,000,000 to 20,000,000 cycles good results again seemed to follow more rapidly, whereas at 15,000,000 cycles the results were much worse.

In connection with the relative heating of tissues, it is of interest to note that Schliephake has already conducted tests of the relative heating of different tissues at a considerably lower range of frequencies than those here reported. The tissues concerned were subcutaneous tissue, muscle, bone, and fat, the relative heating of the last three being compared with that of the subcutaneous tissues. The observations covered a frequency range of from 21,400,000 to 85,000,000 cycles. At the lowest range the relative heating of the four tissues was, in the order given above, 10, 5.5, 2.5, and 4, respectively. At a frequency of 66,000,000 cycles, where the most nearly uniform heating of these 4 kinds of tissue was observed, the relative heating, respectively, was 10, 9, 6.4, and 7.5.

The high relative heating of lung tissue, particularly at or near frequencies which, by a suitable design of apparatus, could probably be used for therapeutic purposes, suggests the possibility of the use of this range of frequencies as an auxiliary in the treatment of lung conditions characterized by a local inflammatory process such as lobar pneumonia. There is, of course, nothing new in the suggestion of diathermy for the treatment of pulmonary inflammation. However, at the relatively low frequencies and broad emission characteristic of conventional diathermic apparatus, but little selective heating of lung tissue could be expected, as most of the heating would occur in the subcutaneous tissues and the bones. On the other hand, at the range of frequencies at which these observations were begun, say in the neighborhood of 60,000,000 cycles, for which frequencies oscillators with excellent output could readily be designed and constructed, it would appear practicable, by suitable location of condenser plates, to heat selectively some designated lobe of the lung to a desirable extent, without, at the same time, unduly heating the intervening tissues. The results obtained in the experiments on relative heating would appear to warrant some investigations of such possibility, at least on the larger laboratory animals. There is, however, one difficulty in the way of selective heating which must not be lost sight of, and that is the extent to which temperature *per se* operates upon conductivity to increase this factor. Any therapeutic application of high-

frequency fields to raise the temperature of body parts above the normal must take into account the consideration that the conductivity of the component parts must, at body temperature, be considerably (34 to 36 percent) higher than if they were cooled to room temperature. An increase of 3° or 4° C. in the temperature of a treated part would still further raise its conductivity by an additional 6 or 8 percent. From this it follows that a range of frequencies, which, on theoretical grounds, might show good selective heating effects, provided the tissues did not greatly exceed in temperature the surrounding air, might well be less effective at the much higher body temperature. For this reason, if we were free to choose, we would select a range of frequencies higher than those which, from the data reported in table 1, we might be inclined to select. But here we would encounter the difficulties and limitations imposed in the choice of such higher frequencies by the physical considerations of inductance and capacity which necessarily, under existing conditions, limit our choice of frequencies to those susceptible of practical application with existing facilities.

THE DIELECTRIC CONSTANTS OF BODY TISSUES

In connection with the experiments just reported, and because of the important relation shown by McLennan and Burton to exist between dielectric constant, conductivity, and frequency, with respect to the heating caused by high-frequency fields, an attempt was made to gain a rough idea of the dielectric constants of some of the body tissues at these high frequencies. That these did not differ greatly from that of water was already shown by the circumstance that, in the experiments dealing with the relative heating in high-frequency fields of body fluids and tissues, the auxiliary circuit was resonated to the oscillator frequency with distilled water as the fluid in the vessel. The circuit was then found to be in excellent resonance with the oscillator when a like volume of body fluids and tissues was substituted for the water in the heating tests. The use of 5 cc of some liquid having a lower dielectric constant than that of water, such as 98 percent ethyl alcohol, was followed by severe detuning of the resonator.

Since only an approximate idea of these dielectric constants was desired, no great accuracy was attempted, use being made of the following resonance method: Short pieces of no. 10 copper wire, with the ends ground flat and heavily silver plated, were sealed with DeKhotinsky cement in two holes opposite each other, halfway down a cylindrical glass vessel holding about 12 cc. The distance separating the ends of the wire inside the vessel was about 4 mm. The external

ends of the wires were each connected by a length of stout copper wire to the terminals of a thermal galvanometer. This formed a resonating circuit similar to those already employed to study the heating effect of the high frequency fields upon organic fluids and tissues, with the difference that the two wires and their flat terminal surfaces, together with the material in which they were immersed, formed the capacity in the circuit. The amount of material required in the vessel to include all the lines of force passing through the condenser was first ascertained by introducing successive portions of distilled water into the vessel until further additions of distilled water produced no decrease in the resonant frequency of the circuit. This point was reached when 9 cc of distilled water had been put into the vessel. In the determinations, 10 cc of distilled water and a corresponding amount of the specimens, the dielectric constants of which were to be determined, was employed. The dielectric constant of the material, as compared with water, would then be approximately determined by comparing the squares of the wave lengths generated by the oscillator when resonated as closely as practicable with the circuit containing the specimen to be tested with the square of the resonating wave length found with 10 cc of water. Since the resonance indicator was a thermal galvanometer (responsive to relatively low currents), very loose coupling with the oscillator could be employed. Hence the "drag" of the resonator upon the oscillator was negligible.

The first material with respect to which determination of the dielectric constant was attempted was heparinized whole rabbit's blood. The attempt was unsuccessful because the conductivity of the blood was so high as to prevent the obtaining of a maximum sufficiently sharp on the thermal galvanometer to indicate resonance of the system with the oscillator. However, fair determinations were practicable with the following material:

Rat's brain, liver, spleen, muscle, and kidney fat. All determinations were carried out at the normal laboratory temperature of about 20° C. The material was first minced with sharp curved scissors, and 10 cc were introduced into the vessel by careful packing so as to exclude all air bubbles and insure as nearly as practicable a homogeneous texture. Five consecutive wave-length determinations were made in the case of brain, liver, spleen, and muscle. In the case of kidney, enough material was available at the time for but 3 such determinations, and for but 2 in the case of the kidney fat.

The following results were obtained:

TABLE 2.—*Dielectric constants of various rat tissues*

[λ=Wave length H_2O=2.8]

Material	Wave length	$\frac{\lambda'^2}{\lambda^2}$	Dielectric constant ϵ if ϵ of water is 78.54 at 25° C.
	λ'		
Brain	2.81	1.0	78.54
Liver	2.754	.967	75.95
Spleen	2.78	.988	77.6
Muscle	2.78	.988	77.6
Kidney	2.76	.972	76.3
Kidney fat	1.16	.173	13.6

With the exception of kidney fat it will be noted that the dielectric constants of these various viscera did not differ materially at this high frequency from that of water. That of brain was practically identical, that of liver somewhat lower than the others. The low dielectric constant of the perinephritic fat is in line with the low dielectric constants of fatty substances in general. For example, according to the physical chemical tables of Landolt-Bornstein (1st supplementary vol., 1932, pp. 562–63) the dielectric constants at 20° C. of castor oil, olive oil, and linseed oil are, respectively, about 4.8, 3.3, and 3.3. We should expect fresh kidney fat to contain a certain amount of moisture and also some proteid material in the supporting areolar tissue and in the walls of the fat cells. This would readily account for a higher dielectric constant than that of the oils mentioned above. In adjusting the oscillator to the resonating frequency of the kidney fat, the sharpness of resonance was considerably greater than was the case with respect to the other tissues, thus indicating a considerably lower specific conductivity. Were data at hand as to the specific conductivity of this tissue, the frequency at which maximum heating would take place could be computed with a fair degree of probability. At all events this frequency should be considerably lower than the frequencies for other body tissues, because of the low conductivity. On the other hand, because of the low dielectric constant, the frequency at which maximum heating occurs would be considerably higher than for material having a like conductivity, but a dielectric constant approximating that of water.

SUMMARY

The Magnetron tube and associated circuit permit the generation of electromagnetic oscillations up to a frequency of 400,000,000 cycles per second. Investigation of the comparative heating of various body tissues and fluids was carried out in a range of eight different frequencies beginning at 64,000,000 and ending at 300,000 000 cycles per second, each frequency differing from its predecessor by

25 percent. The heating of blood serum was the standard to which the heating of all the other tissues was referred. Compared with blood serum, the most conspicuous differences in heating of the various organs and tissues were observed in the case of the lower frequencies. At the highest frequency (30×10^7 cycles) the relative heating tended to become more nearly uniform, although lung and brain tissue still showed a considerably greater tendency to heat than did blood serum even at this frequency.

An attempt was made to gain an approximate idea of the dielectric constants of some body tissues and fluids in this range of frequencies, employing a resonance method. Because of the high conductivity of whole blood, the attempt to obtain its dielectric constant failed. Approximate values of dielectric constants were obtained for brain, liver, spleen, muscle, and fat. With the exception of fat, the approximate values of the other dielectric constants differed but little from the dielectric constant of water, that of brain being practically identical, and that of liver being about 96 percent that of water. Fat showed a low dielectric constant, in the neighborhood of 13.6, which is higher than this value in vegetable oils, such as castor, olive, and linseed oils. The higher figure may be due to the presence of moisture and proteids in the fresh fat.

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COURT DECISION RELATING TO PUBLIC HEALTH

Conviction for unlawful possession of morphine affirmed.—(California First District Court of Appeal, Div. 1; *People* v. *Sinclair*, 19 P. (2d) 23; decided Jan. 28, 1933.) The defendant and another were charged jointly with having had in their possession unlawfully a quantity of morphine. They were tried together and found guilty, and each was sentenced to a term of imprisonment. The defendant appealed and urged, as one ground for reversal, that the evidence as to him was insufficient to sustain the conviction.

It appeared that an inspector of the State narcotic division and an informer entered an automobile driven by the defendant after the inspector had been introduced to the defendant by the informer. The inspector then told defendant that he wanted to buy some morphine. Both the inspector and the informer gave the defendant some marked money for the purchase of the morphine. The defendant then drove the automobile to a certain place where he picked up his codefendant. The car then proceeded only a short distance when it was crowded to the curb and stopped by a car driven by another narcotic inspector. When the defendant saw the other car closing in, he directed his codefendant to "drop the window and throw that out." Complying, the codefendant immediately threw a match box into the street. When picked up by one of the inspectors, the box was found to contain two cubes of morphine.

The district court of appeal stated that "Where, as here, possession, as distinguished from sale, is charged, in order to establish guilt it is essential to prove that the possession was immediate and exclusive and under the dominion and control of the person charged with such possession", and held that the facts were amply sufficient to establish all of the elements of the crime.

The defendant argued that it was necessary to show that the person accused had the unlawful article on his person, but the court said that "manifestly, such is not the law, because, if it were, it would exclude entirely from the operation of the statute (Deering's Gen. Laws Supp. 1925–27, act 5994, sec. 8) cases of joint posses-

sion, or possession by carrying the illegal article in an automobile or other conveyance, or keeping it in some place under the immediate and exclusive control of the accused."

The judgment of the lower court was affirmed.

DEATHS DURING WEEK ENDED JULY 1, 1933

[From the Weekly Health Index issued by the Bureau of the Census, Department of Commerce]

	Week ended July 1, 1933	Corresponding week, 1932
Data from 85 large cities of the United States:		
Total deaths	7,283	7,094
Deaths per 1,000 population, annual basis	10.2	10.1
Deaths under 1 year of age	522	561
Deaths under 1 year of age per 1,000 estimated live births [1]	43	44
Deaths per 1,000 population, annual basis, first 26 weeks of year	11.5	12.0
Data from industrial insurance companies:		
Policies in force	67,779,572	72,288,818
Number of death claims	12,192	13,658
Death claims per 1,000 policies in force, annual rate	9.4	9.9
Death claims per 1,000 policies, first 26 weeks of year, annual rate	10.5	10.2

[1] 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended July 8, 1933, and July 9, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 8, 1933, and July 9, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended July 8, 1933	Week ended July 9, 1932	Week ended July 8, 1933	Week ended July 9, 1932	Week ended July 8, 1933	Week ended July 9, 1932	Week ended July 8, 1933	Week ended July 9, 1932
New England States:								
Maine		1			1	48	0	0
New Hampshire		1			6	23	0	0
Vermont		1			41	56	0	0
Massachusetts	11	28			413	467	1	0
Rhode Island	1	1			1	16	0	0
Connecticut	2	1	1	1	58	100	0	0
Middle Atlantic States:								
New York	36	70	[1] 3	[1] 3	697	987	1	6
New Jersey	20	25	3	1	323	414	1	3
Pennsylvania	27	44			420	518	2	2
East North Central States:								
Ohio	29	18		6	283	319	3	1
Indiana	7	17	13	8	34	29	1	1
Illinois	19	41	18	6	178	260	9	0
Michigan	21	13		1	171	934	0	1
Wisconsin	1	2	5	9	127	363	1	0
West North Central States:								
Minnesota	4	5		1	31	32	0	1
Iowa	6	9			7	2	1	0
Missouri	23	21		1	64	13	1	0
North Dakota	2				29	6	0	0
South Dakota		4			4	1	0	0
Nebraska	4	7		5	45	2	0	0
Kansas	2	4		1	34	54	0	0
South Atlantic States:								
Delaware	2				6		0	0
Maryland [2 3]	11	6	1	1	8	10	0	0
District of Columbia [3]	1	10	1		11	5	0	0
Virginia	3	7			53	58	0	1
West Virginia	13	12	1	7	12	173	1	1
North Carolina	12	11		4	74	186	0	1
South Carolina [4]	5	3	115	123	66	82	0	0
Georgia [4]	8	7		18	50	32	0	1
Florida [4]	4	5	1		19	1	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 8, 1933, and July 9, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended July 8, 1933	Week ended July 9, 1932	Week ended July 8, 1933	Week ended July 9, 1932	Week ended July 8, 1933	Week ended July 9, 1932	Week ended July 8, 1933	Week ended July 9, 1932
East South Central States:								
Kentucky	7				17		0	1
Tennessee	5	8	5	12	94	1	2	3
Alabama [4]	7	12	5	3	22	2	1	1
Mississippi	2	6					0	0
West South Central States:								
Arkansas	5	3	3	2	68		1	0
Louisiana	10	15	6	14	9		0	0
Oklahoma [5]	10		6	8	11	11	0	1
Texas [4]	49	34	44	19	153	91	0	3
Mountain States:								
Montana [3]	1	2			17	24	0	1
Idaho	1		1		1		0	0
Wyoming [3]					1	14	0	0
Colorado [3]	3	4			5	29	0	0
New Mexico	5	4			6	1	0	0
Arizona	3			2	15	1	0	0
Utah [2]					27	4	0	1
Pacific States:								
Washington	1	3	1		32	77	1	0
Oregon [3]	2	4	5	3	30	34	0	1
California	29	17	15	34	343	103	2	4
Total	414	486	253	293	4,119	5,583	29	35

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended July 8, 1933	Week ended July 9, 1932	Week ended July 8, 1933	Week ended July 9, 1932	Week ended July 9, 1933	Week ended July 9, 1932	Week ended July 8, 1933	Week ended July 9, 1932
New England States:								
Maine	0	2	2	10	0	0	0	5
New Hampshire	0	0	14	8	0	0	0	1
Vermont	0	0	2	3	0	1	0	0
Massachusetts	7	0	93	190	0	0	3	2
Rhode Island	0	0	10	11	0	0	0	0
Connecticut	0	1	23	17	0	0	0	2
Middle Atlantic States:								
New York	4	3	177	257	0	0	31	14
New Jersey	0	1	48	84	0	0	6	8
Pennsylvania	0	4	177	255	0	0	8	14
East North Central States:								
Ohio	1	3	184	73	5	7	37	21
Indiana	1	1	21	28	1	3	5	7
Illinois	3	3	115	110	2	2	31	23
Michigan	0	1	158	190	1	3	3	8
Wisconsin	0	0	36	16	7	1	1	2
West North Central States:								
Minnesota	1	2	11	31	0	9	0	1
Iowa	1	1	11	5	6	2	0	2
Missouri	1	0	13	9	1	0	5	19
North Dakota	1	1	2		2	0	1	0
South Dakota	0	0	5	5	0	0	0	1
Nebraska	0	1	14	9	6	2	1	0
Kansas	0	0	8	8	0	1	16	6
South Atlantic States:								
Delaware	0	0	3	7	0	0	3	1
Maryland [2 3]	3	0	22	18	0	0	11	13
District of Columbia [3]	0	0	3	4	0	0	0	3
Virginia	0	0	17	20	0	2	49	53
West Virginia	0	1	13	3	0	0	20	26
North Carolina	0	0	14	9	0	0	37	28
South Carolina [4]	0	2		5	0	0	47	50
Georgia [4]	0	0	5	4	0	3	46	51
Florida [4]	0	0			0	0	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 8, 1933, and July 9, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended July 8, 1933	Week ended July 9, 1932	Week ended July 8, 1933	Week ended July 9, 1932	Week ended July 8, 1933	Week ended July 9, 1932	Week ended July 8, 1933	Week ended July 9, 1932
East South Central States:								
Kentucky	1	1	9	12	0	0	65	70
Tennessee	5	0	15	9	0	3	75	114
Alabama [4]	0	1	12	12	0	10	34	20
Mississippi	1	1	8	5	1	2	23	27
West South Central States:								
Arkansas	2	0	2	3	0	0	26	23
Louisiana	1	0	4	1	0	0	27	23
Oklahoma [5]	0	2	7	8	0	2	25	23
Texas [4]	3	4	33	22	9	13	64	103
Mountain States:								
Montana [3]	0	0	7		0	3	5	3
Idaho	0	0			0	3	0	7
Wyoming [3]	0	1	6	4	1	0	0	0
Colorado [3]	0	0	5	12	1	0	2	2
New Mexico	0	0	2	4	0	0	1	6
Arizona	0	0	3		1	0	1	1
Utah [2]	0	0	3	1	0	0	3	0
Pacific States:								
Washington	0	3	20	12	6	6	1	3
Oregon [3]	1	0	10	5	2	7	8	2
California	3	3	88	40	8	5	6	6
Total	40	43	1,435	1,539	60	90	727	804

[1] New York City only.
[2] Week ended Friday.
[3] Rocky Mountain spotted fever, week ended July 8, 1933, 17 cases, as follows: Maryland, 1; District of Columbia, 1; Montana, 2; Colorado, 1; Wyoming, 10; Oregon, 2.
[4] Typhus fever, week ended July 8, 1933, 76 cases, as follows: South Carolina, 1; Georgia, 25; Florida, 2; Alabama, 35; Texas, 13.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
May 1933										
Mississippi	1	19	893	3,444	1,539	727	4	17	2	23
June 1933										
Arkansas	2	12	1	214	379	140		3	8	65
Connecticut		11	6		763		2	223	0	5
District of Columbia	1	7	1		100	1	0	22	0	2
Maine	1	7	7		10		1	46	0	15
Nebraska	5	19			371		1	40	18	3
North Dakota	3	6	1		605		1	21	1	3
Vermont		1			278		0	24	0	1
Wyoming		1			19		0	24	0	4

May 1933

Mississippi: Cases
- Chicken pox 324
- Dengue 9
- Dysentery (amebic) 96
- Hookworm disease 495
- Mumps 236
- Puerperal septicemia 22
- Rabies in animals 2
- Trachoma 1
- Whooping cough 1,706

June 1933

Botulism:
- North Dakota 1

Chicken pox:
- Arkansas 33
- Connecticut 602
- District of Columbia 15
- Maine 191
- Nebraska 149
- North Dakota 26
- Vermont 77
- Wyoming 29

Conjunctivitis, infectious:
- Connecticut 1

Dysentery (bacillary):
- Connecticut 1

German measles: Cases
- Connecticut 15
- Maine 35

Lead poisoning:
- Connecticut 1

Lethargic encephalitis:
- Connecticut 1

Mumps:
- Arkansas 11
- Connecticut 252
- Maine 15
- Nebraska 73
- North Dakota 6
- Vermont 50
- Wyoming 3

Ophthalmia neonatorum:
- Connecticut 1

Paratyphoid fever:
- Arkansas 10
- Maine 3

Rabies in animals:
- Connecticut 18
- Maine 3

Rocky Mountain spotted fever:
- District of Columbia 3
- Wyoming 30

Septic sore throat: Cases
- Connecticut 9
- Nebraska 1

Tetanus:
- Connecticut 2

Trachoma:
- Arkansas 2
- Connecticut 1

Tularaemia:
- Wyoming 2

Typhus fever:
- Arkansas 1

Undulant fever:
- Arkansas 5
- Connecticut 2
- Maine 2
- Vermont 1

Vincent's angina:
- Maine 3

Vincent's infection:
- North Dakota 16

Whooping cough:
- Arkansas 71
- Connecticut 242
- District of Columbia 48
- Maine 55
- Nebraska 168
- North Dakota 23
- Vermont 45
- Wyoming 25

WEEKLY REPORTS FROM CITIES

City reports for week ended July 1, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0		0	0	1	0	0	0	0	4	22
New Hampshire:											
Concord	0		0	0	0	0	0	0	0	0	15
Manchester											
Nashua	1		0		0	0	0	0	1	0	
Vermont:											
Barre	0		0	11	0	0	0	0	0	0	4
Burlington	0	0	0	0	0	0	0	0	0	0	10
Massachusetts:											
Boston	2		0	171	11	33	0	9	0	36	192
Fall River	0		0	0	2	3	0	0	0	4	22
Springfield	0		0	0	0	2	0	1	0	14	37
Worcester	0		0	65	5	18	0	3	0	1	49
Rhode Island:											
Pawtucket	0		0	0	0	1	0	0	0	0	12
Providence	0		0	0	3	9	0	3	0	19	59
Connecticut:											
Bridgeport	0		0	9	1	10	0	0	0	0	25
Hartford	0		0	2	2	6	0	1	0	0	32
New Haven	1		0	0	2	0	0	0	0	3	35
New York:											
Buffalo	1		0	69	20	19	0	3	0	44	133
New York	33	3	2	307	90	65	0	80	15	95	1,272
Rochester	0		0	0	3	13	0	3	0	18	61
Syracuse	1		0	0	3	4	0	1	0	11	46
New Jersey:											
Camden	0	1	0	1	1	5	0	1	0	0	14
Newark	0	1	0	29	5	11	0	5	0	43	83
Trenton	0	0	0	21	1	3	0	5	1	4	34
Pennsylvania:											
Philadelphia	1	1	1	227	12	44	0	14	1	20	406
Pittsburgh	6	1	1	7	8	33	0	6	1	100	164
Reading	1		0	3	1	2	0	1	0	5	24
Scranton	0	0	0	0	0	3	0	0	0	3	

City reports for week ended July 1, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Ohio:											
Cincinnati	1	0	0	7	7	6	0	5	1	9	151
Cleveland	9	14	0	1	9	31	0	13	1	53	198
Columbus	2	0	0	1	4	10	0	6	3	0	76
Toledo	3	------	0	23	1	30	0	4	0	23	65
Indiana:											
Fort Wayne	2	------	0	0	0	0	0	1	0	0	19
Indianapolis	0	------	0	34	4	0	0	5	1	7	--------
South Bend	0	------	0	1	1	0	0	0	0	1	21
Terre Haute	0	------	0	13	0	2	0	0	0	2	19
Illinois:											
Chicago	0	2	1	135	21	91	0	45	2	72	616
Cicero	0	0	0	0	0	0	0	0	0	0	4
Springfield	0	------	0	0	1	0	0	0	2	2	30
Michigan:											
Detroit	12	0	0	55	2	24	0	14	4	158	245
Flint	0	------	0	0	2	6	0	0	0	1	19
Grand Rapids	0	------	0	2	2	4	0	0	0	4	25
Wisconsin:											
Kenosha	0	------	--------	2	-------	1	0	-------	0	24	--------
Madison	0	------	--------	3	-------	1	0	-------	0	7	--------
Milwaukee	0	------	0	3	1	15	0	7	0	111	72
Racine	0	------	0	0	0	7	0	0	0	24	17
Superior	0	------	0	0	0	0	0	0	0	3	11
Minnesota:											
Duluth	0	------	0	34	2	0	0	0	0	40	20
Minneapolis	5	------	0	3	3	9	0	5	0	8	103
St. Paul	0	------	0	7	3	4	0	3	0	65	61
Iowa:											
Des Moines	1	------	--------	0	-------	1	0	-------	0	0	25
Sioux City	2	------	--------	0	-------	2	0	-------	0	6	--------
Waterloo	0	------	--------	0	-------	0	0	-------	0	1	--------
Missouri:											
Kansas City	4	0	0	1	6	3	0	5	1	5	108
St. Joseph	0	------	0	4	3	1	0	0	1	0	37
St. Louis	12	------	--------	119	6	5	0	11	13	13	231
North Dakota:											
Fargo	0	------	0	2	1	2	0	0	0	0	9
Grand Forks	0	0	0	0	0	0	0	0	0	2	--------
South Dakota:											
Aberdeen	1	------	0	0	0	0	0	0	0	0	--------
Sioux Falls	0	------	0	1	0	0	0	0	0	0	6
Nebraska:											
Omaha	0	------	0	39	4	2	1	1	0	9	59
Kansas:											
Topeka	0	------	0	8	0	3	0	0	0	0	30
Wichita	0	------	0	0	4	3	0	1	1	5	46
Delaware:											
Wilmington	1	------	0	5	1	0	0	0	0	2	21
Maryland:											
Baltimore	0	0	0	0	9	29	0	9	0	61	185
Cumberland	0	------	0	0	0	1	0	0	0	0	10
Frederick	0	------	0	0	0	0	0	0	0	0	4
District of Columbia:											
Washington	3	0	0	43	7	7	0	9	0	26	121
Virginia:											
Lynchburg	0	------	0	31	0	1	0	2	0	12	15
Norfolk	0	------	0	0	3	2	0	1	2	10	--------
Richmond	0	------	0	1	2	1	0	2	0	13	40
Roanoke	0	0	0	2	0	2	0	0	1	4	10
West Virginia:											
Charleston	0	------	0	0	0	0	0	0	0	5	12
Huntington	3	------	0	0	0	0	0	0	0	0	--------
Wheeling	1	0	0	0	1	1	0	0	0	22	17
North Carolina:											
Raleigh	0	------	0	0	0	0	0	1	1	0	19
Wilmington	0	------	0	3	0	0	0	0	0	0	4
Winston-Salem	0	1	0	0	0	0	0	4	1	2	--------
South Carolina:											
Charleston	0	------	0	0	0	0	0	1	2	9	20
Columbia	0	------	1	0	1	0	0	0	0	0	8
Greenville	2	------	0	1	0	0	0	1	0	2	9
Georgia:											
Atlanta	3	12	0	7	4	0	0	4	1	0	--------
Brunswick	0	------	0	0	0	0	0	1	0	1	1
Savannah	0	3	0	0	0	0	0	2	1	6	36
Florida:											
Miami	0	------	0	0	0	1	0	1	0	7	19
Tampa	1	0	0	0	0	0	0	0	1	6	13

City reports for week ended July 1, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Kentucky:											
Ashland	0	------	0	0	0	0	0	------	1	12	------
Lexington	0	------	0	0	1	0	0	2	0	0	15
Louisville	5	------	0	1	5	3	0	2	1	9	60
Tennessee:											
Memphis	0	------	0	69	1	0	0	7	6	29	69
Nashville	0	------	0	4	1	2	0	2	1	7	43
Alabama:											
Birmingham	1	------	0	0	3	2	0	3	4	4	55
Mobile	0	------	0	0	0	0	0	0	0	0	16
Montgomery	0	------	------	0	------	0	0	------	0	0	------
Arkansas:											
Fort Smith	0	------	------	0	------	0	0	------	0	2	------
Little Rock	0	------	0	14	2	0	0	1	0	0	3
Louisiana:											
New Orleans	3	2	1	1	6	2	0	16	0	1	150
Shreveport	0	------	0	3	0	0	0	2	1	0	37
Oklahoma:											
Oklahoma City	0	6	------	4	4	2	0	3	0	10	45
Tulsa	0	------	------	9	------	1	0	------	0	8	------
Texas:											
Dallas	7	------	0	2	0	5	1	3	2	12	69
Fort Worth	0	------	0	0	4	1	0	1	1	4	35
Galveston	0	------	0	0	3	0	0	0	0	1	20
Houston	3	------	0	0	4	0	0	6	0	0	69
San Antonio	0	------	0	5	5	0	0	13	0	0	89
Montana:											
Billings	0	------	0	0	0	0	0	0	0	0	5
Great Falls	0	------	0	0	0	0	0	0	0	0	6
Helena	0	------	0	0	0	1	0	0	1	0	5
Missoula	0	------	0	0	0	0	0	0	0	0	9
Idaho:											
Boise	0	------	0	1	0	0	0	0	0	3	5
Colorado:											
Denver	3	------	3	1	11	6	0	3	0	6	77
Pueblo	0	------	0	0	1	0	0	2	0	0	9
New Mexico:											
Albuquerque	0	------	0	0	0	1	0	1	1	11	7
Utah:											
Salt Lake City	0	------	0	37	0	4	0	1	0	30	18
Nevada:											
Reno	0	------	0	0	0	0	0	0	0	0	5
Washington:											
Seattle	3	------	------	5	------	1	0	------	0	8	------
Spokane	0	------	------	41	------	0	0	------	0	0	------
Tacoma	0	------	0	1	0	1	0	0	0	0	17
Oregon:											
Portland	0	------	0	1	0	8	10	0	0	1	55
Salem	0	------	0	0	0	0	0	0	0	0	------
California:											
Los Angeles	23	4	1	119	11	25	6	15	0	74	256
Sacramento	0	------	0	0	0	0	0	1	2	8	16
San Francisco	2	2	0	3	6	0	0	9	0	23	125

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases	State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts:				Michigan:			
Boston	1	0	3	Flint	1	0	0
Connecticut:				Iowa:			
Hartford	0	0	1	Des Moines	0	0	1
New York:				Missouri:			
New York	2	1	5	St. Louis	0	1	0
Pennsylvania:				Kentucky:			
Pittsburgh	1	1	1	Louisville	1	1	0
Ohio:				Tennessee:			
Columbus	0	0	1	Memphis	1	0	0
Indiana:				Oregon:			
Indianapolis	2	0	0	Portland	0	1	0
Illinois:				California:			
Chicago	6	5	0	San Francisco	0	0	1

Lethargic encephalitis.—Cases: New York, 1; Pittsburgh, 1; Detroit, 1; Birmingham, 1; New Orleans, 1

Pellagra.—Cases: Philadelphia, 1; Charleston, S.C., 3; Atlanta, 1; Birmingham, 8; Montgomery, 1; Shreveport, 1.

Typhus fever.—Cases: Baltimore, 1; Charleston, S.C., 1; Savannah, 3; New Orelans, 1. Deaths: New Orleans, 1.

FOREIGN AND INSULAR

CANADA

Quebec Province—Communicable diseases—Ten weeks ended May 6, 1933.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 10 weeks ended May 6, 1933, as follows:

Disease	2 weeks ended—				
	Mar. 11	Mar. 25	Apr. 8	Apr. 22	May 6
Cerebrospinal meningitis	2	1	1	3	
Chicken pox	428	243	465	488	273
Diphtheria	47	43	45	42	27
Erysipelas	13	21	28	21	16
German measles	5	21	8	6	53
Influenza	14	6	6	12	5
Measles	385	161	316	387	335
Ophthalmia neonatorum		1		2	
Poliomyelitis	2	1	1	4	2
Puerperal septicemia	1	4	1		2
Scarlet fever	179	122	93	132	144
Tuberculosis	133	153	156	99	139
Typhoid fever	24	25	29	19	32
Undulant fever			1	1	
Whooping cough	345	234	183	106	107
Other communicable diseases	220	180	188	141	146

ITALY

Communicable diseases—Four weeks ended March 5, 1933.—During the 4 weeks ended March 5, 1933, cases of certain communicable diseases were reported in Italy as follows:

Disease	Feb. 6–12		Feb. 13–19		Feb. 20–26		Feb. 27–Mar. 5	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	28	23	12	11	3	3	12	12
Cerebrospinal meningitis	11	9	16	10	13	12	22	19
Chicken pox	449	133	355	103	452	118	357	114
Diphtheria and croup	574	287	663	363	701	318	643	318
Dysentery			1	1	5	5		
Lethargic encephalitis	2	2	4	4			4	4
Measles	1,708	213	1,430	214	1,792	239	1,585	209
Poliomyelitis	3	3	4	4	2	2		
Scarlet fever	355	111	352	135	394	121	341	127
Typhoid fever	256	151	206	128	207	131	181	126

VENEZUELA

Vital statistics—Year 1932.—The following figures, showing births and deaths in Venezuela during the year 1932, have been published by the Ministerio de Salubridad y de Agricultura y Cria of Venezuela

Estimated population	3,100,278
Number of births	89,961
Birth rate per 1,000 population	29.0
Number of deaths	54,040
Death rate per 1,000 population	17.4
Deaths from—	
Bronchitis	610
Cancer and other malignant tumors	570
Diabetes	78
Diarrhea and enteritis (under 2 years)	2,527
Diphtheria and croup	56
Dysentery	930
Erysipelas	51
Heart disease	1,854
Leprosy	46
Deaths from—Continued	
Malaria	5,318
Measles	119
Meningitis	265
Nephritis and Bright's disease	670
Pneumonia and broncho-pneumonia	1,674
Poliomyelitis	15
Puerperal fever and septicemia	170
Scarlet fever	10
Syphilis	400
Tetanus, infantile	871
Tuberculosis, pulmonary	3,144
Tuberculosis, other forms	375
Typhoid fever	433
Whooping cough	260

YUGOSLAVIA

Communicable diseases—May 1933.—During the month of May 1933, certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	28	5	Poliomyelitis	2	1
Cerebrospinal meningitis	14	1	Scarlet fever	216	12
Diphtheria and croup	496	42	Sepsis	6	1
Dysentery	40	1	Tetanus	41	14
Erysipelas	141	3	Typhoid fever	158	16
Measles	836	15	Typhus fever	62	7
Paratyphoid fever	7				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for June 30, 1933, pp. 776–786. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued July 28, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

China.—During the week ended July 8, 1933, 2 cases of cholera were reported in Tientsin, China.

Philippine Islands.—During the week ended July 8, 1933, cholera was reported in the Philippine Islands as follows: Cebu Province, Opon, 6 cases, 2 deaths; Occidental Negros Province, San Carlos, 1 case, 1 death.

Plague

India.—During the week ended July 1, 1933, 1 case of plague with 1 death was reported in Bassein, India.

Iraq.—During the week ended July 1, 1933, 3 cases of plague were reported in Baghdad, Iraq.

Typhus Fever

Egypt.—During the week ended July 1, 1933, 9 cases of typhus fever with 3 deaths were reported in Alexandria, Egypt. During the week ended June 24, 1933, Cairo, Egypt, reported 6 cases of typhus fever with 3 deaths from the same cause.

Syria.—Under date of May 4, 1933, an epidemic of typhus fever was reported in Syria, in the Deir-el-Zor district.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

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Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

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INCIDENCE OF ILLNESS AMONG MALE INDUSTRIAL EMPLOYEES IN 1932 AS COMPARED WITH EARLIER YEARS

By Dean K. Brundage, *Statistician, Office of Industrial Hygiene and Sanitation, United States Public Health Service*

In 1932 as a whole the frequency of cases of disabling sickness lasting 8 days or longer among a sample group of male industrial employees differed little from the incidence recorded for the preceding year. In each of the past 3 years, in fact, the sickness rates for this group have exhibited remarkable stability at a lower incidence level than during the 1927–29 period.

For certain causes of disability, however, greater changes in frequency may be noted. The respiratory disease rate was higher in 1932 than in either of the 2 immediately preceding years, due chiefly to an unusual prevalence of influenza in March and again in December 1932. On this account the rate of sickness exclusive of influenza is of particular interest as an index of health conditions aside from influenza. For the group under observation no year of record (1921 to date) shows a lower rate of sickness exclusive of influenza than that for 1932.[1]

Table 1.—*Frequency of specified causes of disability lasting 8 consecutive calendar days or longer per 1,000 male industrial workers representing various industries, by years, from 1927 to 1932, inclusive*

Year in which disability began	Sickness and nonindustrial injuries [1]		Sickness		Respiratory diseases [2]		Sickness exclusive of influenza		Nonrespiratory diseases		Average number of men, all reporting establishments
	A [3]	B [3]	A [3]	B [3]	A [3]	B [3]	A [3]	B [3]	A [3]	B [3]	
1927	103.7	102.0	92.3	90.5	40.2	39.8	74.6	73.0	52.1	50.7	165,465
1928	113.4	111.2	102.5	100.2	50.6	48.8	73.4	72.7	51.9	51.4	163,557
1929	112.4	110.6	99 9	98.1	47.8	46.7	73.9	72.0	52 1	51.4	194,451
1930	94.1	93.9	81.8	81.7	32.0	32.3	68.5	68.3	49.8	49.4	188,714
1931	94.6	93.3	82.2	81.2	34.9	34.8	63.3	62.2	47.3	46.4	171,694
1932	97.5	94.7	84.9	82.3	37.6	37.0	62.9	60.4	47.3	45.3	163,979
5 preceding years [4]	103.6	102.2	91.7	90.3	41.1	40 5	70.7	69.6	50.6	49.8	176,776

[1] Industrial accidents and the venereal diseases are not reported.
[2] Title numbers 11, 23, 104–115a, in the International List of the Causes of Death, fourth revision, Paris, 1929.
[3] In the tables of this article A = all reporting establishments; B = establishments which reported throughout the 6 years ending Dec. 31, 1932.
[4] 1927–31 inclusive.

[1] For the record 1921 to 1927 see Public Health Reports, vol. 47, no. 18, April 29, 1932, pp. 997–1001.

TABLE 2.—*Frequency of specified respiratory diseases which caused disability for 8 consecutive calendar days or longer per 1,000 industrial workers representing various industries, by years, from 1927 to 1932, inclusive* [1]

Year in which disability began	Influenza, grippe (11)		Bronchitis, acute and chronic (106)		Diseases of the pharynx and tonsils (115a)		Pneumonia, all forms (107-109)		Tuberculosis of the respiratory system (23)		Other diseases of the respiratory system (104, 105, 110-114)	
	A	B	A	B	A	B	A	B	A	B	A	B
1927	17.7	17.5	6.0	6.0	6.4	6.1	3.3	3.4	1.6	1.6	5.2	5.2
1928	29.1	27.5	5.7	5.7	5.9	5.6	3.4	3.4	1.1	1.2	5.4	5.4
1929	26.0	26.1	5.3	5.2	7.2	6.3	3.1	3.2	1.2	1.1	5.0	4.8
1930	13.3	13.4	4.6	4.8	6.0	5.8	2.5	2.7	1.1	1.1	4.5	4.5
1931	18.9	19.0	3.6	3.6	5.2	5.0	2.1	2.2	1.0	1.0	4.1	4.0
1932	23.0	21.9	3.6	3.5	4.5	4.4	2.0	2.0	1.0	1.0	4.5	4.3
5 preceding years	21.0	20.7	5.0	5.0	6.1	5.8	2.9	3.0	1.2	1.2	4.8	4.8

[1] In the tables of this article the numbers shown in parentheses are disease title numbers from the International List of the Causes of Death, fourth revision, Paris, 1929.

Although the influenza rate was higher in 1932 than in 1931, there was no increase in pneumonia. This result conforms with the record of mortality in the industrial population. Deaths from pneumonia dropped in 1932 to a new minimum which represented a decline from the previous low point recorded in 1931.[2] There was no change in the frequency of new cases of tuberculosis of the respiratory system in 1932 as compared with the preceding year among the men included in the record of sickness. Mortality records also show favorable rates for tuberculosis.

Other disease groups showing relatively low sickness incidence rates in 1932 in the sample available for the industrial population include digestive diseases as a whole, diseases of the skin, and the infectious and parasitic group of diseases.

The 1932 morbidity record was less favorable for certain disease groups, including diseases of the circulatory system and especially for diseases of the heart, for certain "general" diseases, and for non-industrial injuries.

As has been pointed out in previous communications, these sickness rates are based on the reports of a group of about 40 industrial establishment sick-benefit funds, and apply in the main to employed men, although many work only on a part-time basis. For information concerning the health of the unemployed, other data obviously are required.

TABLE 3.—*Frequency of specified diseases of the digestive system which caused disability for 8 consecutive calendar days or longer per 1,000 male industrial workers representing various industries, by years from 1927 to 1932, inclusive*

Year in which disability began	Digestive diseases, total (115b-129)		Diseases of the stomach except cancer (117, 118)		Diarrhea and enteritis (120)		Appendicitis (121)		Hernia (122a)		Other digestive diseases (115b, 116, 122b-129)	
	A	B	A	B	A	B	A	B	A	B	A	B
1927	15.1	14.9	5.0	5.0	1.4	1.3	4.5	4.4	1.6	1.6	2.6	2.6
1928	14.6	14.5	4.7	4.8	1.3	1.2	4.2	4.2	1.8	1.7	2.6	2.6
1929	15.6	15.6	4.7	4.7	1.5	1.4	4.5	4.5	1.8	1.9	3.1	3.1
1930	14.8	14.5	4.7	4.7	1.5	1.5	4.0	3.7	1.7	1.8	2.9	2.8
1931	13.4	12.9	4.0	3.6	1.2	1.2	3.7	3.5	1.8	1.9	2.7	2.7
1932	13.3	12.6	4.0	3.7	1.0	1.0	3.4	3.3	1.9	1.9	3.0	2.7
5 preceding years	14.7	14.5	4.6	4.5	1.6	1.3	4.2	4.1	1.7	1.8	2.8	2.8

[2] *Cf.* Statistical Bulletin, Metropolitan Life Insurance Co., vol. 14, no. 2, Jan. 1933, p. 4.

TABLE 4.—*Frequency of specified nonrespiratory, nondigestive diseases which caused disability for 8 consecutive calendar days or longer per 1,000 male industrial workers representing various industries, by years, from 1927 to 1932, inclusive*

Year in which disability began	Nonrespiratory, nondigestive diseases, total		Diseases of the circulatory system, except diseases of the veins (90–99, 101–103)		Diseases of the veins (100)		Diseases of the heart (90–95)		Nephritis, acute and chronic (130–132)	
	A	B	A	B	A	B	A	B	A	B
1927	37.0	35.8	3.2	3.2	1.5	1.4	2.1	2.0	0.8	0.8
1928	37.3	36.9	3.4	3.5	1.7	1.7	2.1	2.1	.8	.8
1929	36.5	35.8	3.4	3.6	1.7	1.7	2.2	2.3	.8	.8
1930	35.0	34.9	3.4	3.5	1.6	1.6	2.1	2.2	.7	.7
1931	33.9	33.5	3.2	3.3	1.8	1.5	2.0	2.1	.7	.7
1932	34.0	32.7	3.7	3.6	1.8	1.7	2.5	2.4	.8	.8
5 preceding years	35.9	35.3	3.3	3.4	1.7	1.6	2.1	2.1	.8	.7

Year in which disability began	Other diseases of the genito-urinary system and annexa (133–138)		Neuralgia, neuritis, sciatica (87a)		Neurasthenia and the like (87b)		Other diseases of the nervous system (78–85)		Diseases of the organs of vision (88)	
	A	B	A	B	A	B	A	B	A	B
1927	2.2	2.0	2.3	2.3	1.4	1.4	1.0	1.0	1.4	1.4
1928	2.2	2.2	2.2	2.2	1.4	1.4	1.0	1.0	1.1	1.1
1929	2.2	2.1	2.5	2.5	1.3	1.2	1.1	1.0	1.0	1.0
1930	2.4	2.3	2.3	2.2	1.2	1.2	1.0	1.1	1.1	1.1
1931	2.3	2.2	2.1	2.1	1.5	1.4	1.1	1.3	1.0	1.0
1932	2.3	2.1	2.3	2.3	1.3	1.1	1.2	1.2	.9	.8
5 preceding years	2.3	2.1	2.3	2.3	1.4	1.3	1.0	1.1	1.1	1.1

Year in which disability began	Diseases of the ear and of the mastoid process (89)		Rheumatism, acute and chronic (56, 57)		Diseases of the organs of locomotion except diseases of the joints (156b)		Diseases of the skin (151–153)		Infectious and parasitic diseases [1] (1–10, 12–22, 24–33, 36–44)	
	A	B	A	B	A	B	A	B	A	B
1927	0.5	0.5	6.3	6.2	3.5	3.2	4.7	4.6	3.8	3.5
1928	.7	.7	6.4	6.3	4.0	3.9	4.4	4.3	4.0	3.9
1929	.7	.6	5.6	5.6	3.9	3.9	4.2	4.2	3.9	3.5
1930	.5	.5	5.6	5.7	3.5	3.5	3.8	3.8	3.8	3.5
1931	.7	.6	5.4	5.4	3.3	3.5	3.2	3.3	3.3	2.9
1932	.7	.7	5.3	5.5	3.3	3.6	2.7	2.7	2.7	2.1
5 preceding years	.6	.6	5.9	5.8	3.6	3.6	4.1	4.0	3.8	3.5

Year in which disability began	Cancer, all forms (45–53)		Other general diseases [2] (54, 55, 59–77)		Diseases of the bones and joints (154–156a)		Ill-defined and unknown causes of disability (200)		Nonindustrial injuries	
	A	B	A	B	A	B	A	B	A	B
1927	0.6	0.6	1.3	1.2	1.0	1.1	1.5	1.4	11.4	11.5
1928	.4	.4	1.2	1.1	.7	.7	1.7	1.7	10.9	11.0
1929	.4	.4	1.2	1.2	.8	.7	1.8	1.8	12.5	12.5
1930	.5	.5	1.2	1.2	.7	.8	1.7	1.7	12.3	12.2
1931	.6	.6	1.2	1.2	.6	.6	1.9	1.9	12.4	12.1
1932	.6	.6	1.7	1.7	.4	.5	2.3	1.7	12.6	12.4
5 preceding years	.5	.5	1.2	1.2	.8	.8	1.7	1.7	11.9	11.9

[1] Except influenza, respiratory tuberculosis, and the venereal diseases.
[2] Includes nutritional diseases, diseases of the endocrine glands, diseases of the blood and blood-making organs, chronic poisonings, and intoxications.

DERMATITIS FROM CHEMICALS USED IN REMOVING VELVET PILE

By Louis Schwartz, *Senior Surgeon, United States Public Health Service*, and Louis Tulipan, M.D., New York City

During the summer of 1932, a new style of designs on velvet came into vogue. Pile was removed from the velvet in the shape of the design desired, by means of a chemical velvet remover. A number of firms in New York City and elsewhere were engaged in the manufacture of this new product.

The removal of pile by a chemical requires the use of one fiber in the pile and another in the foundation.

In the processes investigated, there was a silk foundation with a regenerated cellulose rayon pile and the pile was removed in most shops by the use of aluminum chloride, but some of the shops used sulphuric acid, and some others, hydrochloric acid. When aluminum chloride is used, it is mixed in water to form about a 30-percent solution, a sufficient amount of gum tragacanth is added to make a mucilage, and a small amount of formaldehyde is added as a preservative. The jelly-like mixture which results is brushed over the material through a stencil. The material is then placed in a dryer, where carbonization of the pile is completed. After removal from the dryer, the charred pile is scraped off with a spoon, exposing the foundation in the required design.

Other chemicals may be used if the fiber combinations of pile and foundation are different. For instance, a silk pile with a cotton foundation would require the removal of the silk with calcium thiocyanate or caustic soda. A cellulose acetate rayon pile with a regenerated cellulose rayon foundation would require acetone to remove the cellulose acetate rayon pile. A wool or silk foundation having a cotton or regenerated cellulose rayon pile would require hydrochloric acid or aluminum chloride or sulphuric acid to remove the pile. The cases reported occurred while the patients were working with the latter combination.

Where sulphuric or hydrochloric acid is used, a solution of about 7 percent strength is made in water and sprayed with a spray nozzle on the material through a stencil and then treated in the same way as when aluminum chloride is used.

CASES REPORTED

Three cases of dermatitis occurring in 2 girls and 1 man who worked for a firm engaged in manufacturing this material came for treatment to the office of one of the writers. The girls were engaged in removing the charred pile from the designs by means of scraping with a spoon. The man was engaged in spraying a 7 percent solution of sulphuric acid on the velvet through a stencil by means of a spray gun.

Case 1.—R.F., female, age 18; occupation, scraper of velvet which had been sprayed with acid and then baked. After working about 1 week at this occupation, patient noticed a red spot on the left hand. This gradually spread, and in a short time the forearms to the elbow of both arms were involved.

The patient presented on the dorsa of both hands and surfaces of the forearms a scarlatinaform eruption consisting of closely aggregated erythematous papules. This disappeared after a few days under calamine lotion and after stopping work. At the time of this report she was engaged in another occupation and is well.

Case 2.—H.F., female, age 19; occupation, velvet pile remover.

For the 3 weeks preceding the investigation, patient had been employed at scraping off velvet pile which had been sprayed with acid and then baked. After the first week, she noticed an eruption on her hands and arms.

On the palms and the palmar surfaces of the fingers, there were yellowish-brown irregular patches. On the dorsa of the hands were discrete reddish papules in confluent patches, more marked on the right hand. Three days following the first examination, a maculopapular eruption developed on the chest and abdomen. Similar lesions were also present on back of the neck, the forearms, and the cubital fossae. The tongue and mouth showed no changes, and there was no elevation of temperature. The eruption showed some resemblance to a toxic erythema. Under treatment with a calamine lotion and absence from work, the rash completely disappeared in 1 week. At the time of this report she was free from rash and was engaged in another occupation.

Case 3.—L.B., male, age 46; occupation, patternmaker.

For 2 weeks patient had worked on an experimental process for preparing designs on artificial velvet by spraying a sulphuric acid solution from an air gun onto a frame holding the velvet. He held the gun with his right hand and steadied the frame with the left. The acid spray caused him to sneeze "just like hay fever."

The patient presented on the forearms a confluent erythematous papular and bullous eruption which was most marked on the flexor surfaces and more severe on the left than on the right forearm. There were no lesions on the hands. This man continued working while he had the eruption, which became steadily worse until he had to stop working. The eruption improved, but reappeared when he returned to work. He had to give up the occupation altogether.

Inquiry at the factory revealed that 3 girls and 1 man worked in the pile-removing department, and that dermatitis developed in all 4 of them, but the fourth worker, a woman, had only a mild case on her arms and neck and did not seek the advice of a physician. After the occurrence of these cases, the firm substituted aluminum chloride

paste for the dilute sulphuric acid and also changed from white to colored workers. Since that time no more cases have developed.

The manufacturer of the spray gun, being interviewed, stated that he knew of some cases of workers with his spray gun employed in the process of velvet removal whose skins became severely inflamed as a result of this occupation. None of these cases was seen by the writer.

The manufacturer of the aluminum chloride jelly was interviewed, and he stated that he obtained the formula which he is now using from the Bureau of Standards, and that it consisted of about 30 percent solution of ammonium chloride in water, to which there was added a small amount of gum tragacanth for thickening purposes, and a small portion of formaldehyde solution as a preservative. He stated that he had personally known of 2 cases of dermatitis developing from the use of the velvet remover which his firm manufactured. He stated that in these cases the irritation resulted because the persons working with the velvet remover had their arms moist with the remover and that they went to the dryer with their hands and arms wet, and the heat of the dryer changed the moisture on the skin to hydrochloric acid, which produced the irritation.

The chief of the division of industrial hygiene of the State of Connecticut stated in an interview that 5 such cases had been reported to him as occuring in Connecticut, and that they were attributed to the use of aluminum chloride in the form of a jelly, as described above.

DISCUSSION

The skin irritant in the 3 cases cited was the 7 percent solution of sulphuric acid used in the air gun. Although complete carbonization is supposed to take place in the drying oven, yet the pile scraped off the velvet by the girls had an irritating action on the skin. All the materials which are used for removal of pile from the various materials are skin irritants. Even the small amount of formaldehyde used as a preservative in the aluminum chloride-tragacanth combination may be a skin irritant to hypersensitive individuals.

The Connecticut cases occurred among users of the aluminum chloride-tragacanth-formaldehyde mixture.

The use of acid solutions as a spray seems to be more hazardous than the use of the aluminum chloride jelly. In the manufacturing concern where the patients in the 3 cases here reported worked, the substitution of the aluminum chloride jelly for the sulphuric acid solution and the employment of colored persons stopped the occurrence of dermatitis. Whether the skins of colored people are less sensitive to this material than the skins of white people has not yet been determined.

Workers in this process should be protected by wearing rubber gloves and long sleeves, and those using the spray gun and scraping

the charred pile should do such work under an exhaust hood and, in addition, should wear rubber gloves and long sleeves.

ADDITIONAL NOTES ON THE PREPARATION AND EXAMINATION OF THICK BLOOD FILMS FOR MALARIA DIAGNOSIS[1]

By W. H. W. Komp, *Sanitary Engineer, United States Public Health Service*

This paper is intended to supplement a previous article on the preparation and examination of thick blood films by Dr. M. A. Barber and the author (1). Several points mentioned in that paper are here treated more fully, and certain additional matters of technique and of equipment for field surveys which have been found useful are described.

PREPARATION OF SLIDES

Clean slides by bringing them to a boil in a strong solution of soap powder. It is important to cover the slides completely with the solution, as otherwise those only partially covered may be etched. It is well to use a generous amount of solution (which may be used for successive batches) and to stir the slides gently from time to time. They should then be rinsed in several changes of water, and allowed to dry. They are then immersed in 95 percent ethyl alcohol in a small photo-developing tray, several hundred at a time. Each slide is wiped free from alcohol with a lintless cheesecloth rag and placed in a slide box holding 25 slides. When the box is filled it is inverted and the slides are dumped onto a strip of paper (three sheets of ordinary roll toilet paper do well) and wrapped to form a dust-proof package. This is bound with a rubber band, replaced in the box, and the lid is put on. A scouring powder may be used instead of the soap powder, in which case a thin film of the powder is allowed to dry on the slides. This is rubbed off with a soft cloth. This method dispenses with the alcohol.

The grade of slides known as "half-white" and of medium thickness should be used, as white slides scratch and etch more readily than do those with a slightly greenish tint, and slides which are too thick have an annoying tendency to stick in the grooves of the slide boxes when they are inverted. The method outlined above gives an opportunity to test the slides for thickness and length; all should be rejected which are too short or too thick to fit the slide box.

COLLECTING BLOOD SPECIMENS

Gauze, not cotton, wet, not merely moistened, with ethyl alcohol, should be used to clean the skin of the dorsal surface of the middle

[1] Manuscript received for publication in March 1931.

finger of the left hand, at the base of the nail. Rub dry with clean gauze. Be sure that the skin and needle are dry before pricking the finger; otherwise some of the blood-corpuscles may be fixed by the alcohol. The skin should be punctured with a light, quick prick, deeply enough to cause the blood to appear at once, but not so deeply that the blood will flow freely. The end of the finger is then squeezed until a large drop of blood is obtained. It is essential that the "sticking" be accomplished with a minimum of trauma, as in school surveys small children easily become nervous at the sight of their comrades' gory fingers, and in populations being resurveyed at short intervals many refusals will be met unless the blood is obtained as painlessly as possible. For this work the use of the Moore blood lancet is not recommended. The needle found to give the best results is a heavy (No. 10) worsted needle, the end of which, previously heated in a flame, is ground to a point, forming a fairly obtuse triangular pyramid. This needle is easily kept sharp by grinding its three faces at frequent intervals on a fine carborundum stone. The needle should be fixed in a cork at least an inch and a quarter in diameter, and kept in a wide-mouth bottle partly filled with ethyl alcohol. Before taking the blood on the slide, give the slide a quick wipe on a small piece of gauze pinned to the left coat sleeve. Touch the top of the drop of blood with the slide, and carefully draw a circle with the blood, about three quarters of an inch in diameter (about as big as a dime), and about a quarter of an inch from the end of the slide. Squeeze the finger again if necessary to draw more blood, and fill in the circle with blood obtained from the top of the drop. Avoid touching the skin with the slide. Do not make the film too thin. This is the most common error of beginners in using this technique. The second common error is in obtaining too little blood, and the third is in neglecting instructions relative to cleanliness of finger and slide, and thereby mixing dirt and bacteria in the thick film. It is unnecessary to spread the blood with the needle or with the corner of another slide. Keep the slides from becoming warmed in the sun; otherwise the blood will dry too quickly, and may crack and flake off from the thicker parts of the film. Avoid overdrying the blood films before staining, as partial fixation of the film may result.

POOLED FILM METHOD

A time-saving method of pooling the blood of two or more individuals which has proved useful in experienced hands, but which is not recommended for general use, is the following: The first drop of blood from the puncture is placed towards the edge of the slide near one end, and the rest of the blood from the puncture is spread in the usual thick film near the other edge of the slide, at the same end. The first drop of blood from the next individual to be examined is

then placed alongside the first drop, nearer the middle of the slide. The remainder of the blood from the second individual is pooled with that of the first in the thick film. There will then be three films of blood on the same slide. If the pooled blood film is found positive, then both individual drops must be examined to determine whose blood is infected. If the thick film is negative, both individuals are counted negative, thus saving half the technician's time in the examination of slides. The writer has had success with the pooling of the bloods of as many as three individuals on one slide, checking the accuracy of the method by examining the individual films from each donor. This method of course finds its greatest usefulness in surveying populations with low parasite rates, say 10 percent or less; otherwise nearly as much time would be consumed in examining the individual films as would be used if they were on separate slides.

MARKING THE SLIDES

A blue china-marking pencil has been found best for numbering slides. Later findings as to parasites and types may then be noted with a red pencil. Make the figures large, using an initial distinguishing letter or symbol for each group surveyed. If a definite number of specimens only is to be obtained, much time will be saved if the slides are numbered beforehand. If a large number of slides is to be obtained, the first and the last slides only in each box need be numbered, leaving the remainder to be marked later.

DRYING FILMS

Put the slides in the slide box with the film side down, the blood films all toward the left, and the numbers toward the right. Start to fill the box from the bottom, as this will help prevent tipping over. The most convenient support for the slide box consists of two pieces of soft wood, each about as long and wide as a slide box, and about half an inch thick. One piece is fastened perpendicular to the other at its middle, forming an inverted T. Two slide boxes are placed back to back on this support, and held by a heavy rubber band.[2]

In warm weather, slides collected one afternoon may be stained the next. In cooler weather, after the slides have been placed in blocks (see next section), they may be placed in a metal tray and left in the sun for half an hour, if an incubator is not available. Avoid overdrying, in any case. Best results will be obtained if specimens are stained as soon as possible after collection. Loss of a portion of the film may be due to insufficient drying, greasy slides, or to too violent manipulation during staining or decolorizing. Insufficient drying is responsible for most of this trouble.

[2] I am indebted to Dr. H. E. Meleney, Vanderbilt University, for this suggestion.

STAINING

While it is more convenient to use prepared stain, for thick films I prefer a Giemsa stain made up omitting the Azur II component. The formula is as follows: Dissolve 0.3 grams Azur II eosin in 13 cc of C.P. anhydrous glycerin at 60° C. (140° F.) on a waterbath; then add 37 cc of C.P. acetone-free methyl alcohol at the same temperature. Several stain powders have been found satisfactory. The slides in the boxes have the blood-films all to the left and the numbered ends to the right. Pasteboard separators are placed between the numbered ends, and slides and separators are dumped on to the cover of the slide-box, as described in the previous paper (1). Separators of uniform and proper thickness may be made from the cardboard used in packing plates and films, and is obtainable from photographers anywhere. "Separators should not be more than an inch and a quarter long. If they are longer they may reach and absorb the stain, swell and stretch the rubber bands, sometimes even breaking them. Sometimes the wet pasteboard may stick to the wax-pencil marking and remove it when the slides are separated after drying." [3] A most satisfactory substitute for pasteboard separators, free from many of their objectionable characteristics, may be made from old discarded 1- by 3-inch microscope slides of proper thickness. These are broken in half after being scratched across the middle with a diamond, and any sharp edges left are ground off. These glass separators do not absorb moisture, and the wax-pencil markings do not adhere to them. Old photographic plates, from which the film has been removed, may be cut up into separators. Because of their more uniform thickness and freedom from flaws, these are more suitable for this use than ordinary glass. "If rubber bands are used to hold the block of slides and separators together, avoid cutting the rubber bands against the sharp edges of the slides by wrapping the block with a narrow strip of heavy paper before putting on the bands. The paper strips should be narrow to keep them out of the stain, heavy to avoid the use of more than one strip to the block, and hard finished to prevent absorption of moisture too easily. One of the separators may be marked with name, number or symbol, and any other necessary data, and placed under the rubber bands on the outside of each block of slides, providing an easy means of identification of each block. The film side of the first slide of the block should be turned inward to avoid scraping off the film during staining and decolorizing." [3]

The best fastener for the blocks of slides and separators is a small ring of ¼-inch width elastic webbing. Never depend on rubber bands to hold the block together longer than necessary to stain the slides.

A convenient dish in which to stain a number of slides economically is a white-enameled sterilizing tray 3 by 8 inches by 1½ inches deep.

[3] Suggestions by Miss Aimee Wilcox, microscopist, United States Public Health Service.

This holds about 200 cc of dilute stain to the proper depth to stain six blocks of 25 slides each at one time. Small ice-box dishes with straight sides are also convenient receptacles. Put the stain into the dish, then pour on the water. Do not mix further. The usual directions for dilution say one drop to 1 cc, staining for 1 hour. Good results and a saving of time in examination may be obtained by increasing the thickness of the drop of blood, using 1½ drops of stain per cc and increasing the time to 1½ hours. Decolorization in clean water may proceed for as long as 20 minutes if these directions are used, but 5 minutes is usually sufficient if the slides have been stained according to the usual directions. Slides which show a central spot of brown after staining have not been in the stain long enough for it to penetrate the entire thickness of the film and should be restained. The annoying deposit of bundles of needle-shaped yellow crystals sometimes found on thick films after staining is due to a floating scum formed possibly from the interaction of the glycerin with other stain components. It may be avoided by keeping the staining containers perfectly clean, and by flushing out the stain in the containers with a gentle stream of water before removing the block of slides. In this way the floating scum is flushed over the edge of the container and does not adhere to the slides.

One of the most usual causes of failure with Giemsa staining is the use of diluting water of insufficient purity or of improper hydrogen-ion concentration. To insure the elegant differentiation of the malaria parasite from other blood elements of which a good Giemsa stain is capable, use distilled water at a hydrogen-ion concentration of 7.0. In the writer's experience he has never found a distilled water, even fresh from the still, which is of proper reaction, all, without exception, proving too acid. The water he uses at present has a hydrogen-ion concentration of 5.6 as it comes from the still, and is neutralized with dilute sodium-hydroxide solution to pH 7.0, a test being made on each lot of water immediately before it is added to the stain. As improperly cleaned staining-dishes may alter the reaction of water placed in them, it is well to fill them with neutral water and let them stand for some minutes before using them. This rinse water is poured out and fresh water used for dilution.

The use of "tap water" (a meaningless term, for it includes anything used as a public water supply, ranging from an acid surface water, which may contain iron or humic acids, to a hard limestone water) is not recommended, as, apart from its possibly unsuitable natural composition, it is often subject to great seasonal variation because of necessary chemical treatment at the waterworks. For this reason, a tap water which may give satisfaction over a long period may suddenly alter in composition or reaction, with consequent loss of an important batch of slides. Free chlorine, or large amounts of chlorides, will

spoil a water otherwise suitable for staining, causing a muddy redness of the background of laked red cells, and dimming the bright blue of the cytoplasm of the parasite. The use of phosphate buffers, adding as they do comparatively large amounts of foreign salts to the diluting water, has never proved as satisfactory as the use of distilled water neutralized with the extremely small amount of free alkali required, and hence is not recommended. Their only advantage is that they retain over a period of time their given hydrogen-ion concentration. However, as it takes but a few minutes to test a large amount of diluting water, and to bring it to neutrality, this advantage is not of sufficient importance to warrant their use. The most useful hydrogen-ion indicator solution, so far as the writer's experience goes, is phenol red. The indicator standards, consisting of sealed ampoules containing liquid, are very satisfactory and comparatively cheap, but for permanence those using colored glass disks or plates are preferred. Avoid those types which require prior dilution of the sample with distilled water before making the determination.

EXAMINATION OF THICK FILMS

The use of the microscope for long periods of time is likely to throw considerable strain on the eyes unless certain precautions are observed. An oculist should examine the eyes before any long-continued work is undertaken. Unsuspected deviations from the normal, easily corrected by lenses or prisms, may account for much unnecessary eyestrain. If as much as a diopter of astigmatism is found, it is well to correct it with a supplementary lens fitted in a slip-on barrel, placed over the microscope eyepiece. This will be found much superior to the use of spectacles.

If the ordinary monocular microscope must be used, it is well to train either eye to use it. The advantages of the mon-objective binocular microscope have been well described by Dr. W. M. James, in the Sixteenth Annual Report of the Medical Department, United Fruit Co., 1927, p. 268, as follows: "Where protracted work must be accomplished, such, for instance, as looking through a large number of stools or thick films in surveys, the saving of eyestrain by the binocular is worth all of its extra cost. Nor is there any loss in definition, as some urge. For some years, I have made careful comparisons between the binocular and monocular tubes on the most difficult test objects, and the resolution and definition with the former are in every way equal to those of the latter, and in some respects they are better, particularly in low-power work. There is a perceptible loss of light with the binocular, especially with higher powers, but this is readily compensated by increasing the intensity of the illumination, and seldom is noticed except in working with immersion lenses and high-power eyepieces."

Care should be taken not to over-illuminate the field. Use only so much light as is necessary to recognize the parasites. Learn to distinguish them first by their morphology; then open the diaphragm of the microscope and bring out the contrasting colors of chromatin and cytoplasm.

It is well known that the sensitivity of the eye is greatest in dim light. This fact should be borne in mind in selecting a place in which to do microscopical work. The darker the room for this purpose, the better. This fact can easily be checked up by examining slides after nightfall, and noting the increased brilliance of the image even with small diaphragm apertures.

The many types of "binocular attachments" to be fitted to the tube of the ordinary monocular microscope are not to be recommended, as they increase the tube-length, and with it the magnification, so that the field covered is too small. In searching through large numbers of slides, the smaller the magnification consistent with recognition of the object sought, the better. Nothing higher than a 5X eyepiece should be used for a searcher, with an objective of 90 to 100X.

It is sometimes desirable to mark the position of parasites found in a smear, especially if they be few in number. The accuracy of a technician's diagnosis, or his ability in typing parasites, may be checked in this way. The "object-marker," an apparatus made for this purpose, is fitted into one of the openings in the rotating nose piece of the microscope, in place of the high dry objective. The parasite whose position it is desired to mark is centered in the oil-immersion field, the objective is then racked up, and the object-marker swung into its place and lowered until its crystal point barely grazes the slide. It is then turned through 360 degrees, scoring a minute circle about the object. To find the object again, it is only necessary to find the circle with the low-power objective, and then to examine the area within the circle for the object sought. It is well to have a spare marker on hand, as the crystal points are somewhat fragile and easily broken off.

In the previous paper (l. c., p. 2340), mention is made of the amount of time to devote to the examination of thick films. It is stated that this may be worked out in terms of time spent on each slide. The author prefers to express it in terms of the number of microscope fields examined, as being slightly more accurate. The author's experience in two surveys may be of interest in this connection. In northern Haiti, over 7,000 laborers were examined, of whom about 26 percent proved positive for malaria. The number of the field in which the first parasite was found was noted in 100 consecutive positives. The following table gives the results:

Table showing the field in which the first parasite was found in 100 consecutive positives (Haiti, 1927)

No. of field	Number of positives	No. of field	Number of positives
1–10	47	61–70	2
11–20	13	71–80	2
21–30	9	81–90	6
31–40	10	91–100	3
41–50	2		
51–60	6		100

Eighty-one percent of the total of 100 positives was found in the first 50 fields, and nearly half of them were found in the first 10 fields. The equipment used was a standard monocular microscope fitted with a fluorite objective and a 5X ocular. In a survey in a highly infected population in northwest Florida, 61 percent of 100 consecutive positives was found in the first 20 fields. The author has made it a rule to examine at least 100 fields in every slide, increasing this number to 150 or to 200 if the slide contains suspicious appearances or numerous basophilic blue "clouds" indicative of anaemia. A tally counter is used, and 10 fields are counted before depressing the lever, so that only 10 movements of the counter lever need be made for each slide examined. The type of counter found best for this purpose is one which "clicks" at each tenth depression of the lever, so that the operator need not look at the figures. The counter is held in the left hand while the right hand moves the mechanical stage.

A word may be said about the substitution of heavy mineral oil (liquid petrolatum, heavy, U.S.P. IX), known under various trade names, for the usual cedar oil for oil immersion. It has three very decided advantages: It is not sticky or gummy, it does not decolorize the film as does cedar oil, and it may be left on the film after examination, if it is desired to preserve the slide for future use. The slide need not then be washed off with xylol, but is merely flooded with fresh mineral oil. Heavy mineral oil may sometimes become cloudy from water of condensation. It is then useless and should be discarded. In very warm climates additional viscosity may be imparted by the addition of a small amount of petrolatum.

EQUIPMENT FOR FIELD SURVEYS

The rapidity with which a field survey can be made depends somewhat on the ease with which the slides, boxes, and other apparatus may be manipulated. A useful kit for carrying equipment is a strong enameled steel box, fitted with a carrying handle and lock, measuring 8 by 16 inches by 9 inches deep. A wooden carrier, somewhat like a carpenter's tool kit, is made to fit inside. This carrier holds the wooden slide boxes, slide-box support, needle, gauze and other accessories.

The ends of the carrier are made about 8 inches high, and a handle about 3 inches wide extends the length of the carrier, and makes a convenient wide, flat surface on which to lay slides while being numbered. A very useful and necessary addition to the equipment is a small card listing the equipment needed for surveys, which is glued to the inside of the cover of the steel box.

The use of cards instead of a notebook for recording names and other data was mentioned in the previous publication. In a mixed population, cards of different colors may be used to advantage in denoting the various races. As a means of numbering the cards consecutively in the field, an automatic numbering stamp is convenient. It saves considerable time, and its automatic action reduces to a minimum errors in numbering the cards consecutively.

Name______________________	
Age_______________________	
Symbol__________ No. ☐ Negative	
Estivo-Autumnal______	Rings__________ Crescents_______
Tertian__________	Rings__________ Schizonts_______ Gametocytes_____
Quartan__________	Rings__________ Schizonts_______ Gametocytes_____
Mixed____________	

Data on card used by the author

Several useful procedures in obtaining bloods may be mentioned here. It is good psychology in the case of a large family, any member

of which shows reluctance to be examined, to take the blood of the youngest child first. Sleeping babies often may be examined without waking them, if the blood is drawn from the big toe. It is well, also, to list all names and ages on the cards first, before any blood is taken, so that the various members of the group may be called up in order. The mere fact that their names and ages have been recorded seems to act as an intangible force overcoming to a degree their natural disinclination. A few pieces of candy (caramels wrapped in waxed paper for ease in handling) often work wonders in obtaining young children's consent to be examined.

Ages as well as names should be entered in the record, as duplication of names is not uncommon, and the individuals may be more easily distinguished if the respective ages are known. The given names should be listed, instead of an initial only.

The applicability of the thick-film method is not confined to malaria diagnosis alone, but to the diagnosis of any blood parasite taking the Romanowsky coloration, found in mammalian blood. It is not applicable for use in infections of blood containing nucleated red cells, such as avian or reptilian blood. It has been used most successfully in diagnosing piroplasma and trypanosome infections of horses and cattle, and in trypanosome and filaria infections of monkeys and other laboratory animals. The recent discovery of a focus of Chagas' disease, South American trypanosomiasis, in Panama, (2) is probably due to the use of this method; as even in thick films the parasites were very scanty, and would doubtless have been missed entirely in thin films.

REFERENCES

(1) Method of Preparing and Examining Thick Films for the Diagnosis of Malaria. M. A. Barber and W. H. W. Komp. Public Health Reports, vol. 44, no. 39, Sept. 27, 1929.

(2) Chagas' Disease in Panama; Report of Three Cases. J. W. Miller, M.D. So. Med. Jl. vol. 24, no. 7, July 1931.

COURT DECISION RELATING TO PUBLIC HEALTH[1]

Provisions of milk control board act relative to the fixing of minimum prices for milk held constitutional.—(New York Court of Appeals; *People* v. *Nebbia;* decided 1933.) The defendant was convicted in the city court of Rochester of a violation of chapter 158 of the New York Session Laws for 1933. The offense charged was a sale of two 1-quart bottles of milk and a loaf of "Italian bread" for 18 cents, which was conceded to be a violation of the said chapter 158, inasmuch as the State milk control board had fixed a minimum price

[1] The abstract of this case was prepared from a mimeographed copy of the complete decision furnished to the Public Health Service by Dr. Thomas Parran, Jr., Commissioner of Health of the State of New York.

for milk of 9 cents per quart. The Monroe County court affirmed the conviction and the defendant appealed to the court of appeals. The question before the appellate court was whether the statute, so far as it provided for fixing minimum prices for milk, was unconstitutional under section 6 of article 1 of the State constitution and amendment 14 of the Federal Constitution, in that it interfered with the right of a milk dealer to carry on his business in such manner as suited his convenience without State interference as to the price at which he should sell his milk.

The statute in question became a law April 10, 1933, and, by its terms, was to be in effect only until March 31, 1934. It was enacted after a thorough legislative investigation of the milk situation in the State and begins with a legislative declaration reading as follows:

SEC. 300. *Legislative finding; statement of policy.*—This article is enacted in the exercise of the police power of the State, and its purposes generally are to protect the public health and public welfare. It is hereby declared that unhealthful, unfair, unjust, destructive, demoralizing and uneconomic trade practices have been and are now carried on in the production, sale and distribution of milk and milk products in this State, whereby the dairy industry in the State and the constant supply of pure milk to inhabitants of the State are imperiled. That such conditions constitute a menace to the health, welfare and reasonable comfort of the inhabitants of the State. That in order to protect the well-being of our citizens and promote the public welfare, and in order to preserve the strength and vigor of the race, the production, transportation, manufacture, storage, distribution and sale of milk in the State of New York is hereby declared to be a business affecting the public health and interest. That the production and distribution of milk is a paramount industry upon which the prosperity of the State in large measure depends. That the present acute economic emergency, being in part the consequence of a severe and increasing disparity between the prices of milk and other commodities, which disparity has largely destroyed the purchasing power of milk producers for industrial products, has broken down the orderly production and marketing of milk and has seriously impaired the agricultural assets supporting the credit structure of the State and its local governmental subdivisions. That the danger to the public health and welfare is immediate and impending, the necessity urgent and such as will not admit of delay in public supervision and control in accord with proper standards of production, sanitation and marketing. The foregoing statements of fact, policy and application of this article are hereby declared as a matter of legislative determination.

A milk control board of three members was created by the act, which board was given wide powers to meet the emergency. Among other things, the board was required to fix by order the minimum wholesale and retail prices for milk handled within the State for fluid consumption, including the prices on sales by milk dealers to consumers. Under the act, the term "milk dealer" included dealers who ran stores, unless the milk was consumed on the premises. A violation of the law or of a rule or order of the board lawfully made was declared to be a misdemeanor, punishable by not more than a

year's imprisonment or not more than $100 fine or both. In summarizing the law, the court of appeals said:

The appellant not unfairly summarizes this law by saying that it first declares that milk has been selling too cheaply in the State of New York, and has thus created a temporary emergency; this emergency is remedied by making the sale of milk at a low price a crime; the question of what is a low price is determined by the majority vote of three officials. As an aid in enforcing the rate regulation, the milk industry in the State of New York is made a business affecting the public health and interest until March 31, 1934, and the board can exclude from the milk business any violator of the statute or the board's orders.

The fixing of minimum prices was declared by the court to be one of the main features of the act. "The power thus to regulate private business", said the court, "can be invoked only under special circumstances. It may be so invoked when the legislature is dealing with a paramount industry upon which the prosperity of the entire State in large measure depends. It may not be invoked when we are dealing with an ordinary business, essentially private in its nature." The view was taken that the production of milk was, on account of its great importance as human food, a chief industry of New York State, the court saying:

* * * It is of such paramount importance as to justify the assertion that the general welfare and prosperity of the State in a very large and real sense depend upon it. The entire milk product cannot be sold locally. It must be sold to milk gatherers to be shipped to centers of population. Distributors buy the milk from the farmer. The purchaser is compelled to take what the shipper offers. The shipper offers a low rate at which milk cannot profitably be produced. The State seeks to protect the producer by fixing a minimum price for his milk to keep open the stream of milk flowing from the farm to the city and to guard the farmer from substantial loss. *People* v. *Perretta*, 253 N.Y. 305. Price is regulated to protect the farmer from the exactions of purchasers against which he cannot protect himself.

After reviewing a number of cases which could be cited in support of the instant statute and also several cases which could be cited in opposition to it, the court of appeals reached the conclusion that the provisions assailed were not unconstitutional, saying:

Doubtless the statute before us would be condemned by an earlier generation as temerarious interference with the rights of property and contract (*Matter of Jacobs*, 98 N.Y. 98; *Lochner* v. *New York*, 198 U.S. 45); with the natural law of supply and demand. But we must not fail to consider that the police power is the least limitable of the powers of government and that it extends to all the great public needs; that constitutional law is a progressive science; that statutes aiming to establish a standard of social justice, to conform the law to the accepted standards of the community, to stimulate the production of a vital food product by fixing living standards of prices for the producer, are to be interpreted with that degree of liberality which is essential to the attainment of the end in view (*Austin* v. *City of New York*, supra, p. 117); and that mere novelty is no objection to legislation (*People ex rel. Durham R. Corp.* v. *LaFetra*, 230 N.Y. 429).

The State courts should uphold State regulation action wherever possible. They should be clearly convinced that a statute is unconstitutional before they declare it invalid. (Cf. *Ives* v. *South Buffalo Ry. Co.*, 201 N.Y. 271, with Arizona

Employers' Liability case, supra; also cf. *People ex rel. Rodgers* v. *Coler*, 166 N.Y. 1, with *Atkin* v. *Kansas*, supra.)

With full respect for the Constitution as an efficient frame of government in peace and war, under normal conditions or in emergencies, with cheerful submission to the rule of the Supreme Court that legislative authority to abridge property rights and freedom of contract can be justified only by exceptional circumstances and, even then, by reasonable regulation only, and that legislative conclusions based on findings of fact are subject to judicial review, we do not feel compelled to hold that the "due process" clause of the Constitution has left milk producers unprotected from oppression and to place the stamp of invalidity on the measure before us.

With the wisdom of the legislation we have nought to do. It may be vain to hope by laws to oppose the general course of trade. * * *

We are unable to say that the legislature is lacking in power, not only to regulate and encourage the production of milk but also, when conditions require, to regulate the prices to be paid for it, so that a fair return may be obtained by the producer and a vital industry preserved from destruction. (Hamilton: "Affectation with Public Interest," 39 Yale Law Journal, 1089, 1101.) The policy of non-interference with individual freedom must at times give way to the policy of compulsion for the general welfare.

DEATHS DURING WEEK ENDED JULY 8, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended July 8, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	6,870	6,784
Deaths per 1,000 population, annual basis	9.6	9.7
Deaths under 1 year of age	506	555
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	41	45
Deaths per 1,000 population, annual basis, first 27 weeks of year	11.5	11.9
Data from industrial insurance companies:		
Policies in force	67,752,739	72,162,038
Number of death claims	9,938	9,124
Death claims per 1,000 policies in force, annual rate	7.6	6.6
Death claims per 1,000 policies, first 27 weeks of year, annual rate	10.4	10.1

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended July 15, 1933, and July 16, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 15, 1933, and July 16, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended July 15, 1933	Week ended July 16, 1932	Week ended July 15, 1933	Week ended July 16, 1932	Week ended July 15, 1933	Week ended July 16, 1932	Week ended July 15, 1933	Week ended July 16, 1932
New England States:								
Maine	1	3			2	21	0	0
New Hampshire	1				6	14	0	0
Vermont	1				27	33	0	0
Massachusetts	19	33		2	340	341	2	0
Rhode Island	2	4				8	0	0
Connecticut	6	1	4	5	38	66	1	0
Middle Atlantic States:								
New York	58	62	[1] 3	[1] 1	517	1,048	3	5
New Jersey	24	18		3	247	282	2	2
Pennsylvania	32	30			346	263	5	3
East North Central States:								
Ohio	26	30	34	10	63	393	0	3
Indiana	16	14	13	12	16	16	5	4
Illinois	14	37	9	18	97	181	5	2
Michigan	28	17	2	16	86	835	0	3
Wisconsin	4	9	11	22	79	273	3	2
West North Central States:								
Minnesota	7	4		2	27	12	0	0
Iowa	4	24			13	8	0	0
Missouri	17	23			53	24	2	2
North Dakota		9			9	8	0	0
South Dakota		3			4	3	0	0
Nebraska	5	5			24	6	2	1
Kansas	4	6	1		10	42	0	1
South Atlantic States:								
Delaware					4		0	0
Maryland [2 3 4]	5	7	2	3	14	17	0	0
District of Columbia	6	8			22	2	0	0
Virginia [3]	13	4			93	29	4	1
West Virginia	3	3	1		12	39	1	0
North Carolina [3 4]	8	17			144	142	2	1
South Carolina	1	2	79	111	29	43	0	0
Georgia [4]	12	9		39	41	12	0	1
Florida [4]	2	14			27		0	0
East South Central States:								
Kentucky	6	8			27	18	0	0
Tennessee	10	6	6	8	77	1	1	2
Alabama [4]	10	12	7	12	31		0	2
Mississippi [2]	8	10					0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 15, 1933, and July 16, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended July 15, 1933	Week ended July 16, 1932	Week ended July 15, 1933	Week ended July 16, 1932	Week ended July 15, 1933	Week ended July 16, 1932	Week ended July 15, 1933	Week ended July 16, 1932
West South Central States:								
Arkansas	1	2	2	1	44	3	0	0
Louisiana [4]	3	12	6	4	16	3	0	1
Oklahoma [5]	4	4	10	8	13	8	0	0
Texas [4]	35	46	41	23	155	9	0	0
Mountain States:								
Montana [3]	1				2	6	0	0
Idaho [3]	2				1	1	0	0
Wyoming [3]	2				2	9	0	0
Colorado [3]	2	5			9	14	0	0
New Mexico	6	6			13		0	1
Arizona					15	1	0	0
Utah [2]	1				35	2	0	0
Pacific States:								
Washington	3	2	1		56	45	0	0
Oregon [3]	1	2	8	8	39	24	0	0
California	29	38	32	29	347	84	2	4
Total	443	549	272	337	3,272	4,389	40	41

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended July 15, 1933	Week ended July 16, 1932	Week ended July 15, 1933	Week ended July 16, 1932	Week ended July 15, 1933	Week ended July 16, 1932	Week ended July 15, 1933	Week ended July 16, 1932
New England States:								
Maine	1	0	2	9	0	0	6	4
New Hampshire	0	0	12	11	0	0	0	0
Vermont	0	0	6	4	0	0	1	0
Massachusetts	24	0	100	138	0	0	3	7
Rhode Island	1	0	3	21	0	0	1	0
Connecticut	0	0	9	25	0	0	5	2
Middle Atlantic States:								
New York	13	9	164	234	0	14	24	20
New Jersey	3	5	70	64	0	0	10	11
Pennsylvania	6	4	130	127	0	0	16	17
East North Central States:								
Ohio	3	3	174	107	0	3	26	34
Indiana	1	1	32	17	0	1	14	26
Illinois	3	4	132	104	12	4	20	45
Michigan	1	0	99	163	1	2	9	7
Wisconsin	0	0	30	22	17	0	7	2
West North Central States:								
Minnesota	3	1	23	21	0	0	0	2
Iowa	1	6	8	13	1	8	0	3
Missouri	4	1	11	30	2	0	15	15
North Dakota	0	1		4	0	1	0	1
South Dakota	0	0	6	6	0	0	1	0
Nebraska	0	1	9	10	0	3	0	1
Kansas	1	1	11	12	0	2	12	6
South Atlantic States:								
Delaware	0	0	1	5	0	0	3	1
Maryland [2 3 4]	4	1	27	12	0	0	18	9
District of Columbia	1	0	6	4	0	0	0	1
Virginia [3]	1	2	20	27	0	0	42	43
West Virginia	0	0	8	2	0	0	18	25
North Carolina [3 4]	0	1	33	18	0	0	38	39
South Carolina	0	0	1	1	0	0	36	67
Georgia [4]	0	0	8	4	0	0	45	59
Florida [4]	0	0	1	4	0	1	1	7
East South Central States:								
Kentucky	2	1	13	14	0	2	101	146
Tennessee	3	0	9	8	0	0	94	110
Alabama [4]	0	1	2	11	0	14	24	25
Mississippi [2]	0	1	4	1	0	1	16	45

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 15, 1933, and July 16, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended July 15, 1933	Week ended July 16, 1932	Week ended July 15, 1933	Week ended July 16, 1932	Week ended July 15, 1933	Week ended July 16, 1932	Week ended July 15, 1933	Week ended July 16, 1932
West South Central States:								
Arkansas	0	0	2	1	0	0	34	26
Louisiana [4]	0	0	6	7	0	0	30	59
Oklahoma [5]	0	1	4	6	1	7	38	34
Texas [4]	1	2	28	37	3	11	57	32
Mountain States:								
Montana [3]	0	0	2	7	1	5	7	2
Idaho [3]	0	0	1	1	3	0	5	1
Wyoming [3]	0	0	2		0	0	1	0
Colorado [3]	1	0	10	4	2	0	2	3
New Mexico	0	0	1	3	4	0	1	1
Arizona	0	0	5	3	0	0	8	2
Utah [2]	0	0	4	2	0	0	4	0
Pacific States:								
Washington	0	3	16	14	13	15	3	2
Oregon [3]	0	0	27	5	5	2	7	4
California	3	2	76	46	18	6	9	16
Total	81	46	1,348	1,389	83	102	812	962

[1] New York City only.
[2] Week ended Friday.
[3] Rocky Mountain spotted fever, 18 cases, as follows: Maryland, 1; Virginia, 2; North Carolina, 4; Montana, 1; Idaho, 1; Wyoming, 4; Colorado, 3; Oregon, 2.
[4] Typhus fever, 75 cases, as follows: Maryland, 1; North Carolina, 2; Georgia, 22; Florida, 4; Alabama, 19; Louisiana, 1; Texas, 26.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
May, 1933										
California	9	172	139	4	6,542	5	10	761	167	33
June, 1933										
Arizona	1	5	5	1	314		1	37	0	10
Iowa	2	22			194		3	49	45	2
Massachusetts	1	84		1	2,419	1	3	1,021	0	9
Michigan	7	136	18	1	2,233		5	1,043	7	15
Missouri	7	73	2	9	607		1	140	5	28
New Jersey	5	87	7		2,936		1	411	0	21
Ohio	6	111	105	1	938		6	1,234	20	92
Tennessee	4	16	42	187	492	66	2	49	3	100

May 1933

California:	Cases
Actinomycosis	2
Chickenpox	2,973
Dysentery, amebic	3
Dysentery, bacillary	13
Food poisoning	21
German measles	115
Granuloma, coccidioidal	7
Mumps	1,585
Ophthalmia neonatorum	1
Paratyphoid fever	4
Psittacosis	2
Rabies in animals	85
Rocky Mountain spotted fever	4
Septic sore throat	8
Tetanus	5
Trachoma	16
Trichinosis	5
Tularemia	1
Typhus fever	1
Undulant fever	11
Whooping cough	2,688

June 1933

	Cases
Anthrax:	
Massachusetts	1
Chicken pox:	
Arizona	29
Iowa	83
Massachusetts	1,007
Michigan	719
Missouri	65
New Jersey	1,276
Ohio	1,055
Tennessee	49
Diarrhea and enteritis (under 2 years):	
Ohio	20
Dysentery:	
Arizona	3
Massachusetts	1
Dysentery—Contd.	
Missouri	9
New Jersey	1
Tennessee	124
Food poisoning:	
Ohio	2
German measles:	
Arizona	5
Iowa	5
Massachusetts	85
Michigan	1,653
New Jersey	70
Ohio	125
Tennessee	83
Lead poisoning:	
New Jersey	4
Ohio	3
Lethargic encephalitis:	
Massachusetts	4
Michigan	1
New Jersey	2
Ohio	1
Mumps:	
Arizona	34
Iowa	128
Massachusetts	534
Michigan	383
Missouri	208
New Jersey	806
Ohio	106
Tennessee	36
Ophthalmia neonatorum:	
Massachusetts	93
New Jersey	1
Ohio	73
Paratyphoid fever:	
New Jersey	2
Tennessee	2
Puerperal septicemia:	
Ohio	8
Tennessee	2
Rabies in animals:	
Missouri	19
New Jersey	17
Rocky Mountain spotted fever:	
Iowa	2
Scabies:	
Tennessee	10
Septic sore throat:	
Massachusetts	13
Michigan	18
Missouri	7
Ohio	179
Tennessee	8
Tetanus:	
Massachusetts	2
Michigan	2
Ohio	6
Tennessee	4
Trachoma:	
Arizona	63
Massachusetts	3
Missouri	27
New Jersey	3
Ohio	6
Tennessee	27
Trichinosis:	
Massachusetts	4
New Jersey	3
Ohio	1
Tularemia:	
Arizona	2
Missouri	4
Undulant fever:	
Arizona	5
Iowa	24
Massachusetts	2
Michigan	17
Missouri	37
New Jersey	5
Ohio	4
Vincent's angina:	
Iowa	1
Michigan	22
Tennessee	1
Whooping cough:	
Arizona	36
Iowa	89
Massachusetts	715
Michigan	990
Missouri	82
New Jersey	685
Ohio	646
Tennessee	242

WEEKLY REPORTS FROM CITIES

City reports for week ended July 8, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	0	0	0	0	0	0	4	16
New Hampshire:											
Concord	0	------	0	0	0	0	0	0	0	0	9
Manchester	0	------	0	0	0	0	0	0	0	0	15
Nashua	0	------	0	0	0	1	0	0	0	0	------
Vermont:											
Barre	0	------	0	20	0	0	0	0	0	3	0
Burlington	0	------	0	0	0	0	0	0	0	0	13
Massachusetts:											
Boston	5	------	0	246	5	38	0	9	0	40	193
Fall River	0	------	0	1	1	2	0	4	0	10	38
Springfield	0	------	0	0	1	2	0	1	0	3	31
Worcester	1	------	0	75	3	3	0	3	2	8	53
Rhode Island:											
Pawtucket	0	------	0	0	0	0	0	0	0	0	8
Providence	1	------	0	0	5	7	0	3	0	25	59
Connecticut:											
Bridgeport	0	------	0	5	0	6	0	1	0	3	24
Hartford	0	------	0	1	1	4	0	2	0	0	39
New Haven	1	------	0	2	3	0	0	0	0	4	40
New York:											
Buffalo	4	------	0	64	18	14	0	7	0	33	133
New York	30	3	5	226	57	31	0	85	17	105	1,161
Rochester	0	------	0	0	3	4	0	2	0	30	70
Syracuse	0	------	0	0	1	4	0	0	0	1	42
New Jersey:											
Camden	3	------	0	2	0	2	0	0	0	0	22
Newark	0	3	0	26	3	3	0	14	0	24	71
Trenton	------	------	0	16	0	3	0	4	0	1	27

City reports for week ended July 8, 1933—Continued

State and city	Diphtheria cases	Influenza: Cases	Influenza: Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Pennsylvania:											
Philadelphia	2	3	2	189	9	22	0	21	1	7	368
Pittsburgh	0	3	1	2	11	22	0	3	0	70	111
Reading	1		1	2	0	1	0	2	0	12	19
Ohio:											
Cincinnati	1		0	3	4	4	0	7	0	19	100
Cleveland	4	14	0	2	6	19	0	9	1	37	158
Columbus	1	1	1	0	3	3	0	4	0	0	61
Toledo	3		0	15	1	26	0	5	3	26	51
Indiana:											
Fort Wayne	2		0	0	1	2	0	1	0	0	28
Indianapolis	1		1	21	5	3	0	1	0	8	
South Bend	0		0	0	0	2	0	1	0	4	12
Terre Haute	0		0	1	2	0	0	1	0	3	23
Illinois:											
Chicago	1		1	123	27	70	0	31	1	69	573
Springfield	0		0	0	2	1	0	0	0	3	25
Michigan:											
Detroit	17		1	25	3	16	0	14	0	97	208
Flint	0	2	0	0	2	7	0	2	0	2	24
Grand Rapids	0		0	0	1	2	0	0	0	6	13
Wisconsin:											
Kenosha	0		0	0	0	0	0	0	0	32	6
Madison	0			2		0	0		0	15	
Milwaukee	0		0	6	2	15	1	2	0	79	71
Racine	0		0	1	0	3	0	0	0	17	10
Superior	0		0	0	0	0	0	0	0	8	7
Minnesota:											
Duluth	0		0	13	0	0	0	0	0	23	13
Minneapolis	1		0	4	5	4	0	1	0	8	77
St. Paul	1		0	5	1	2	0	3	0	51	42
Iowa:											
Des Moines	3			0		3	0		0	0	30
Sioux City	0			0		0	0		0	0	
Waterloo	0			0		1	0		0	0	
Missouri:											
Kansas City	2		0	1	7	5	0	8	0	5	85
St. Joseph	0		0	2	1	1	0	0	0	0	17
St. Louis	20			59	6	3	0	10	3	8	210
North Dakota:											
Fargo	0		0	1	0	0	0	0	0	1	
Grand Forks	0		0	0	0	0	0	0	0	3	
Nebraska:											
Omaha	0		0	15	3	1	0	0	0	3	51
Kansas:											
Topeka											
Wichita	0		0	0	2	0	0	0	0	21	35
Delaware:											
Wilmington	0		0	0	0	0	0	0	0	1	30
Maryland:											
Baltimore	1		0	2	3	16	0	11	1	30	170
Cumberland	0		0	0	0	1	0	0	1	0	10
Frederick	0		0	0	0	0	0	0	2	0	5
District of Col.:											
Washington	1	1	1	11	7	3	0	16	0	5	138
Virginia:											
Lynchburg	0		0	12	0	0	0	0	0	7	18
Norfolk	0		0	0	2	1	0	2	4	0	26
Richmond	0		0	1	0	0	0	3	0	14	58
Roanoke	0		0	0	0	1	0	0	0	5	19
West Virginia:											
Charleston	0		0	0	0	0	0	0	1	0	9
Huntington	0		0	0	0	0	0	0	0	0	0
Wheeling	0		0	2	0	1	0	0	0	9	15
North Carolina:											
Raleigh	0		0	0	0	0	0	1	0	0	12
Wilmington	0		0	1	1	0	0	0	0	0	7
Winston-Salem			0	1	0	0	0	3	0	1	11
South Carolina:											
Charleston	0	7	0	0	1	0	0	0	1	2	14
Columbia	0		0	0	0	0	0	0	0	0	
Greenville	0		0	0	1	0	0	0	3	0	6
Georgia:											
Atlanta	2	1	0	2	4	2	0	3	0	10	76
Brunswick	0		0	1	0	0	0	0	0	3	
Savannah	1	2	0	6	1	0	0	0	0	1	29
Florida:											
Miami	0		0	0	1	0	0	2	0	7	19
Tampa	2			0	1	0	0	0	0	2	23

City reports for week ended July 8, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Kentucky:											
Ashland	0			0		0	0		1	2	
Lexington	0			0		0	0	1	1	0	12
Louisville	1		0	4	6	6	0	3	1	4	10
Tennessee:											
Memphis	3		0	44	5	1	0	7	5	44	98
Nashville	1		0	5	3	0	0	0	2	0	42
Alabama:											
Birmingham	1		0	0	1	2	0	1	3	2	53
Mobile	0		0	2	0	0	0	3	1	0	21
Montgomery	0			0		0	0		0	0	
Arkansas:											
Fort Smith	0			0		0	0		0	2	
Little Rock	0		0	3	1	0	0	2	0	0	5
Louisiana:											
New Orleans	5		0	4	4	1	0	9	3	0	123
Shreveport	0		0	0	2	1	0	1	0	1	18
Oklahoma:											
Tulsa	0			12		0	0		2	16	
Texas:											
Dallas	6	2	2	0	6	6	0	2	0	0	
Fort Worth	1		0	0	4	0	0	1	1	0	37
Galveston	0		0		4	0	0	0	2	0	14
Houston	1		0	0	3	0	0	1	2	0	69
San Antonio	1		1	1	5	0	0	4	0	0	77
Montana:											
Billings	0		0	0	0	0	0	0	0	0	9
Great Falls	0		0	0	0	0	0	0	0	1	8
Helena	0		0	0	0	0	0	0	0	0	3
Missoula	0		0	0	1	0	0	0	0	0	2
Idaho:											
Boise	0		0	0	1	0	0	0	0	7	5
Colorado:											
Denver	0	19	0	3	4	4	0	5	0	13	74
Pueblo	0		0	1	0	0	0	0	0	0	6
New Mexico:											
Albuquerque	0		0	2	1	1	0	3	0	0	9
Utah:											
Salt Lake City	0		0	18	1	2	0	0	0	19	21
Nevada:											
Reno	0		0	0	0	0	0	0	0	0	3
Washington:											
Seattle	1			1		4	0		0	5	
Spokane	0			11		2	0		0		
Tacoma	0		0	2	0	2	0	0	0	4	30
Oregon:											
Portland	0		0	1	0	3	1	2	1	0	61
Salem	0		0	1	0	0	0	0	0	0	
California:											
Los Angeles	12	10	1	92	8	25	3	22	0	38	244
Sacramento	1		0	2	1	3	0	1	0	7	27
San Francisco	0		1	3	5	2	0	7	0	8	129

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts:			
Boston	0	1	3
New York:			
New York	0	2	3
New Jersey:			
Camden	1	1	0
Pennsylvania:			
Philadelphia	0	0	1
Pittsburgh	1	1	1
Reading	1	1	0
Ohio:			
Cleveland	0	0	1
Illinois:			
Chicago	7	2	3

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Michigan:			
Detroit	0	0	1
Missouri:			
Kansas City	1	1	0
Maryland:			
Baltimore	0	0	2
Washington:			
Spokane	1	0	0
Oregon:			
Portland	0	0	1
California:			
Los Angeles	1	0	2
San Francisco	1	0	0

Lethargic encephalitis.—Cases: Philadelphia, 2.
Pellagra.—Cases: Boston, 1; Atlanta, 1; Savannah, 7; Memphis, 2; New Orleans, 2; Los Angeles, 1.
Typhus fever.—Cases: Atlanta, 2; Savannah, 5; Tampa, 1.

FOREIGN AND INSULAR

BARBADOS, BRITISH WEST INDIES

Poliomyelitis.—Information has been received of an outbreak of poliomyelitis in Barbados, B.W.I., 60 cases, with 3 deaths, having been reported up to June 17, 1933. The majority of cases, 48, occurred in children under 5 years of age, and the district most affected was St. Michael's Parish, where 28 of the cases occurred. On June 19 it was said that no new case had been reported for 2 weeks, and the epidemic was thought to be definitely under control.

CANADA

Provinces—Communicable diseases—Two weeks ended July 1, 1933.—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the 2 weeks ended July 1, 1933, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis					4					4
Chicken pox		4		134	541	115	81	20	169	1,064
Diphtheria		2	1	15	16	4	5	1	1	45
Erysipelas				9	1	1		1	4	16
Influenza					1				102	103
Measles		1	4	183	178	4	6	3	40	419
Mumps					167	15	13		28	223
Paratyphoid fever		1			1					2
Pneumonia		4			3		12		4	23
Poliomyelitis				1	3			1		5
Scarlet fever		6	8	64	170	22	11	15	26	322
Smallpox							1			1
Trachoma					8	1	43		9	61
Tuberculosis		1	7	150	50	17	11	8	51	295
Typhoid fever			7	37	11	11	1	4	2	73
Undulant fever					6		2			8
Whooping cough				93	281	111	59	26	85	655

Ontario Province—Communicable diseases—Four weeks ended June 24, 1933.—The Department of Health of the Province of Ontario, Canada, reports certain communicable diseases for the 4 weeks ended June 24, 1933, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	4	2	Poliomyelitis	5	
Chicken pox	1,092		Scarlet fever	303	
Conjunctivitis	2		Septic sore throat	33	2
Diphtheria	27	2	Syphilis	194	1
Erysipelas	4	1	Tetanus	2	
German measles	22		Trachoma	8	
Gonorrhea	190		Trench mouth	1	
Influenza	4	1	Tuberculosis	152	56
Malignant oedema	1		Tularaemia	1	
Measles	369	2	Typhoid fever	29	2
Mumps	492		Undulant fever	13	
Paratyphoid fever	7		Whooping cough	444	
Pneumonia		100			

ENGLAND AND WALES

Vital statistics—1932.—During the year 1932, the birth rate per 1,000 population in England and Wales was 15.3, and the death rate per 1,000 population was 12. Death rates from certain causes were as follows:

Cause	Death rate per 1,000 population	Cause	Death rate per 1,000 population
Diarrhea and enteritis (under 2 years)	[1] 6.6	Scarlet fever	0.01
Diphtheria	.06	Typhoid and paratyphoid fever	.01
Influenza	.33	Violence	.54
Measles	.08	Whooping cough	.07

[1] The death rate for diarrhea and enteritis is computed per 1,000 live births.

For the year 1932, 65 deaths under 1 year per 1,000 live births were recorded.

MEXICO

Vera Cruz—Reportable diseases—December 1932–March 1933.—During the 4 months ended March 31, 1933, the following diseases have been reported in Vera Cruz, Mexico:

Disease	December 1932		January 1933		February 1933		March 1933	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Anthrax				1			2	
Bronchitis		7		3		4		2
Cancer		2		2		3		6
Chicken pox	7		8		12		22	
Conjunctivitis (infectious)			2		4			
Diphtheria	3		4		2		6	2
Dysentery	6	2		5	6	3	15	3
Epilepsy				1		1		
Gangrene		2		2		2		1
Gastroenteritis		50		26		42		42
Hookworm disease		5		4		6		7
Influenza	4	2		3		3		
Leprosy							1	
Leukemia				1				
Malaria	149	4	119	3	72	2	128	7
Measles	8	1		2	5		16	
Meningitis				4		1		2
Peritonitis				1				1
Pernicious anemia		1				1		
Pleurisy		1						1
Pneumonia		22		12		14		10
Poliomyelitis	1	1						
Puerperal fever						1		1
Septic sore throat	2							
Septicemia		1						
Sprue		1				1		
Syphilis, hereditary		4		11		5		6
Tetanus				1	2	2		4
Tinea imbricata	3							
Tuberculosis	22	15	20	19	24	16	36	26
Typhoid and paratyphoid fever	7	2	2		11	1	5	1
Whooping cough	1			2			4	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Dec. 11, 1932–Jan. 7, 1933	Jan. 8–Feb. 4, 1933	Feb. 5–Mar. 4, 1933	Mar. 5–Apr. 1, 1933	Week ended— April 1933				May 1933				June 1933				July 1933	
						8	15	22	29	6	13	20	27	3	10	17	24	1	8
China:																			
Amoy	C	6																	
Hankow	C										[1] 1		1						
	D										1								
Swatow	C										2								
Tientsin	C																		2
India	C	4,524	3,396	3,171	7,878	2,583	2,642	2,701	3,169	2,628	2,058	1,964							
	D	2,400	1,721	5,170	3,852	1,311	1,277	1,460	1,607	1,310	1,011	991							
Bombay	C		1	1			1					1	1				1		
Calcutta	C	54	110	114	327	136	184	186	264	186	192	188	124	78	60	22	36		
Chittagong	C			1	5	3	8	5		10	8	2	1	1		4	2		
Colong	C								1										
Moulmein	C														2				
Rangoon	C						1					1					1		
Vizagapatam	C												1						
India, French: Chandernagor	C		1	2															
Indo-China (see also table below):																			
Pnom-Penh	C	1			1							1	1	1					
Saigon and Cholon	C		2		1		1	2	1									3	
Plague-infected rats											3								
Philippine Islands:																			
Bohol Province	C												15	40	14	13	13		
	D												12	20	9	7	2		
Cebu Province	C			17	2									1		1			
Cebu	C																1		
	D																1		
Opon	C																		6
	D																		2
Santa Fe	C																	2	
	D																	2	
Iloilo Province—Iloilo	C									1									
	D									1									

Leyte Province	C	80	110	78	26		9	3	38	9		9	4		2				
	D	44	76	56	24		7	4	35	8		8	4		2				
Occidental Negros Province	C																19		
	D																9		
San Carlos	C																	5	1
	D																	5	1
Pampanga Province	C												1						
	D												1						
Rizal Province	C									1									
Samar Province	C	135	121		[2] 186		67					29				3	4		
	D	101	75		[2] 144		50					23				3	2		
Siam	C	1	2					1		1									
On vessel: S.S. Dunana at Madras	D												1						

[1] Suspected.
[2] For month of March 1933.

Place		January 1933			February 1933			March 1933			April 1933			May 1933	
		1-10	11-20	21-31	1-10	11-20	21-28	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20
Indo-China (French) (see also table above):															
Cambodia [3]	C				9		1		2	2	5		4		14
	D				6				1	2	5		2		10
Cochin-China [3]	C	1	4	2	9	2	1	8	4	2	2	7			9
	D	1	1		6	2	1	7	3	2	2	7			8

[3] Reports incomplete.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE[1]

[C indicates cases; D, deaths; P, present]

Place		Dec. 11, 1932–Jan. 7, 1933	Jan. 8–Feb. 4, 1933	Feb. 5–Mar. 4, 1933	Mar. 5–Apr. 1, 1933	Week ended— April 1933: 8	15	22	29	May 1933: 6	13	20	27	June 1933: 3	10	17	21
Angola	C			P													
Argentina:																	
Cordoba Province	C	2	1	5	5			1					8				
Jujuy Province	C		10	6													
Rosario	C				2												
San Luis Province	C								7								
Santa Fe	C	1															
Belgian Congo	C	1							P								
Bolivia: Tomina Province	C			P					P								
British East Africa (see also table below):																	
Tanganyika	D		2		1								1				
Uganda	C	141	58	40	44	12	8	13	15	14	24	25	22	17			
	D	134	58	40	44	12	8	13	15	14	24	24	21	16			
Ceylon:																	
Central Province	C		9		6												
	D		7		6												
Colombo	C	4	5	10	13		1									1	
	D	3	3	7	11											1	
Plague-infected rats		4		4													
Dutch East Indies:																	
Batavia	C				[2] 1												
West Java	C	1,152	1,329	1,152		271	259	255	228								
	D	745				271			227								
Ecuador. (See table below.)																	
Egypt:																	
Alexandria	C	2	1		1			1									
Asyut	C	6	4	4	8	4	4	2	2	1	4	3	2	1		1	
Minya	C				2			1									4
France: Marseille	C	1															
Hawaii Territory:																	
Hawaii Island:																	
Hamakua—Kukaiau	C		1														
	D		1														
Plague-infected rats		2	7														
Paauilo—Plague-infected rats		11	1														
Maui Island—Makawao:																	
Plague-infected rats			1														
Omaopio—Plague-infected rats			1														

India	C	6,900	6,662	6,399	5,409	954	801	797	675	671	639	559	------	------	------	------	------
	D	4,349	4,191	3,775	3,498	628	513	511	390	392	418	321	------	------	------	------	------
Bassein	C	------	1	2	12	4	------	6	3	2	1	------	------	1	------	------	------
Plague-infected rats		1	1	2	1	------	1	------	------	------	1	1	1	2	------	------	------
Bombay	C	------	------	3	15	2	2	3	3	2	2	2	------	1	------	1	------
Plague-infected rats		16	28	68	121	22	23	28	30	6	13	7	8	3	5	4	4
Madras Presidency	C	446	508	378	------	------	5	10	12	11	6	------	------	------	------	------	------
	D	249	170	173	------	------	2	1	11	3	3	------	------	------	------	------	------
Rangoon	C	1	1	2	------	------	------	------	------	------	1	------	------	------	------	------	1
Plague-infected rats			1	2	1	------	------	------	------	------	------	------	------	------	------	------	------
Indo-China. (See table below.)																	
Iraq: Baghdad	C	------	------	3	------	------		------	------	------	2	------	1	1	------	------	1
Madagascar. (See table below.)																	
Morocco	C	16	------	4	33	------	12	8	8	2	------	------	------	------	------	------	------
Peru. (See table below.)																	
Senegal. (See table below.)																	
Siam	C	12	7	16	------	1	1	------	------	------	------	------	------	------	1	------	1
South-West Africa.[3]																	
Straits Settlements: Singapore	C	------	------	------	------	------	------	1	1	------	------	------	------	------	------	------	------
Syria: Béirut	C	------	------	------	------	------	------	1	------	------	------	------	------	------	------	1	------
Union of South Africa: Orange Free State	C	P	4	1	------	------	------	------	------	1	1	3	2	------	------	------	------
United States: California—San Benito County—Plague-infected ground squirrels		------	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------
On vessel: S.S. Kingsborough at port in Argentina	C	------	------	------	1	------	------	------	------	------	------	------	------	------	------	------	------

[1] Including plague in the United States and its possessions.
[2] Imported.
[3] 227 cases of plague with 53 deaths were reported in Ovamboland, South-West Africa, up to Dec. 17, 1932. Antiplague measures have been taken.

Place		December 1932	January 1933	February 1933	March 1933	April 1933	May 1933
British East Africa (see also table above): Kenya	C	8	6	11	6	6	------
Ecuador	C	------	1	------	3	------	35
Indo-China	C	3	4	4	4	7	8
	D	3	2	4	4	7	8
Madagascar:							
Province:							
Ambositra	C	149	158	161	155	------	------
	D	125	146	149	154	------	------
Antsirabe	C	57	63	72	63	------	------
	D	56	61	72	62	------	------
Fianarantsoa	C	------	------	40	64	------	------
	D	------	------	42	63	------	------
Maevatanana	C	9	2	6	5	8	------
Madagascar—Continued							
Province—Continued							
Miarinarivo	C	37	75	8	9	------	------
	D	36	14	8	9	------	------
Moramanga	C	186	163	23	48	------	------
	D	183	159	23	46	------	------
Tamatave	C	1	------	------	1	------	------
	D	1	------	------	1	------	------
Tananarive	C	186	198	219	175	------	------
	D	179	190	207	168	------	------
Peru	C	12	4	18	7	2	------
Senegal:							
Dakar[4]	C	19	2	4	1	1	2
	D	17	2	4	------	1	1
Tivaouane[4]	C	------	------	------	------	1	------

[4] Reports incomplete.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Dec. 11, 1932–Jan. 7, 1933	Jan. 8–Feb. 4, 1933	Feb. 5–Mar. 4, 1933	Mar. 5–Apr. 1, 1933	Week ended—											
						April 1933				May 1933				June 1933			
						8	15	22	29	6	13	20	27	3	10	17	21
Arabia:																	
Aden	C	1	2	1													
Muscat—Oman Sultanate	C													44			
	D													11			
Algeria:																	
Algiers	C	1															
Constantine Department	C				1												
Argentina: Chaco Territory	C			P													
Bolivia	C	5		39	21												
Brazil: Porto Alegre (alastrim)	C	16	1														
British East Africa:																	
Kenya	C			14	23		5		8	4							
Tanganyika	C	40	95	56	43	4	5		8			11	2	8			
British South Africa:																	
Northern Rhodesia	C	6		1	21								2				
Southern Rhodesia	C	1	25	22			8										
Canada:																	
British Columbia	C					[1] 6						[1] 1		[1] 1			
Manitoba	C	13															
Ontario	C	5			5							[1] 1		[1] 1			
Toronto	C	3				[1] 3				1							
Saskatchewan	C	1	5	31	14	[1] 2						[1] 5		[1] 1			
Ceylon:																	
Colombo	C	72	75	34	4	1	1			4					1	2	6
Galle	C							39	7	2							
China:																	
Amoy	C		1	5	4	1		1	1			2	1	1			
Canton	C	762	504	234	67	13	10	11	6	3	3	1					
	D	23	13	1				1	1								
Chemulpo	C			17													
Dairen	C	1	4	5	5	1						2	1				
Foochow	C	P	P	P	P		P		P		P				P		
Hong Kong	C	18	78	169	169	36	14	20	14	6	8	3	2	3	2	2	1
Macao	C	P	3	8	11	3	1			4							
Nanking	C	11	38	89	16		1		1		1		1				
Shanghai	C	23	41	28	38	9	8	15	7	4	12	8	9	3	6	12	6

Swatow	C	7	22	21	26	6	7	3		4		3	3	3	1		
Tientsin	C													10			
Chosen. (See table below.)																	
Dahomey	C	5	22	32					26	2	9						
Dutch East Indies	C		1														
Ecuador. (See table below.)																	
Egypt:																	
Alexandria	C	583	987	943	277	12	11	11	8	3	3		5				
	D	116	227	183	70	3	22	8	2	3	1		1				
Cairo	C	8	37	25	9	1	2	2	5	5	4	1	3	3	1		1
Gharbiya	C	37											25				
Port Said	C		2		6	3											
Suez	C		2	4	3												
Great Britain:																	
England and Wales	C	79	66	76	71	31	14	18	33	23	22	30	16	27	18	18	8
London	C	73	59	66	62	24	9	13	29	20	18	27	14	17	16	12	
London and Great Towns	C	76	66	75	66	30	9	14	32	20	18	29	15	17	17	15	7
Greece. (See table below.)																	
Guatemala. (See table below.)																	
Honduras:																	
Puerto Castilla	C				2												
Tegucigalpa	C				14			1			7			3			
Tela	C	2	4	6	3			1									
India	C	11,281	20,423	31,824	34,938	9,222	9,319	11,465	10,373	8,775	8,505	8,861					
	D	3,523	5,907	8,303	8,391	2,218	2,360	2,907	2,803	2,576	2,415	2,391					
Bassein	C			7	13	14	12	10	21	11	2	7	12	4	4	6	2
	D			2	5	3	3	3	5	3	5	1	2	3	4	4	
Bombay	C	230	805	1,522	1,175	159	141	115	95	69	52	44	47	34	18	20	16
	D	98	391	795	717	94	72	65	55	55	35	28	30	22	14	12	10
Calcutta	C	301	961	1,637	1,520	295	245	213	168	118	82	81	61	53	35	25	21
	D	213	672	1,147	1,053	214	188	180	133	97	72	74	46	45	23	19	20
Chittagong	C											1					
	D											1					
Cochin	C				4	2	1	1	1						1		1
Karachi	C	25	45	47	115	34	31	31	34	11	13	18	10	4	10	3	2
Madras	C	156	351	564	666	138	125	115	118	66	67	60	38	36	29	31	48
Moulmein	C			1											12		
Negapatam	C	2	3	2	4	1		2	3	4		1	2	1	1	1	
Rangoon	C	2	5	20	11	7	1	2	5	1	6	2	8	3	1	2	
Tuticorin	C					1											
Vizagapatam	C	1			5	1			3	1		1		1	1	1	2
India (French): Pondichery Territory	C	2															
Indo-China (see also table below): Saigon and Cholon	C	3		3	7			[1] 2									
Iraq:																	
Baghdad	C	13	8	4	2			1	1	3		1	1				
Basra	C	25	6	3	2					5		1		2			
Ireland: Belfast	C			1													
	D			1													

[1] For 2 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Dec. 11, 1932–Jan. 7, 1933	Jan. 8–Feb. 4, 1933	Feb. 5–Mar. 4, 1933	Week ended— Mar. 5–Apr. 1, 1933	April 1933				May 1933				June 1933			
						8	15	22	29	6	13	20	27	3	10	17	24
Japan:																	
Kobe	C				5												
Nagoya	C			1													
Osaka	C			3	4	3	4		1				1				
Tokyo	C				2	3		2	1		1			1			
Yokohama	C							1	2								
Mexico:																	
Coahuila	C			1									1	1			
Juarez	C			3					5				2				
Mexico, D.F.	C		10	5	6	1		5	5		2	1	2		2	3	
Monterrey	D												2				
Saltillo	D	8	4	4	3		1			1	1					2	1
San Luis Potosi	D	2						1		2	1		2			1	
Morocco. (See table below.)																	
Nigeria	C	583	401	1,878	562	853			408		5		164				
Persia	C	216	108	29	26	3	5	28	18	22	30	37		15	16		
	D	82	41	4	4	1	2	7	13	5	21	36		45	17		
Peru. (See table below.)																	
Poland	C	1								1		1					1
Portugal:																	
Lisbon	C	12	4	4	2	1		1			1		1		1	2	
Oporto	C	9	5	5	2							1	1				
Siam: Bangkok	D		2	2	4												
Sierra Leone	C	10	217	36	63		14		8		18		33		6		
Sudan (Anglo-Egyptian)	C		57	34	32		12	1	5	3			2	1			
Syria. (See table below.)																	
Turkey. (See table below.)																	
Union of South Africa:																	
Cape Province	C	P		P	P					P	P						
Orange Free State	C	P		P	P	P	P							P			
Transvaal	C	P	P														
Zanzibar	C			2													
On vessels:																	
S.S. Amassis at Alexandria	C		1														
S.S. Somersetshire at Suez	C		1														
S.S. Star of Alexandria at Alexandria	C	1															

S.S. Volturno at Alexandria	C			1													
S.S. Arimondi at Massaoua	C			2													
S.S. Hatasu at Malta	C				1												
S.S. Talma at Hong Kong	C			1													
S.S. Karapara at Rangoon	C			1													
S.S. Nawab at Rangoon	C		1														
S.S. California at Liverpool	C				1												
S.S. Kalgan at Bangkok from Swatow	C				1												
S.S. Nordland at Alexandria	C				1												
S.S. Hong Kheng at Rangoon	C			1													
S.S. Hiram at Bangkok	C				1												
S.S. Arunda at Rangoon from Calcutta	C				1												
S.S. Haiching at Amoy	C				1												
S.S. City of Nagpur at Karachi	C						1										
S.S. Rajputana at Aden	C										1						
	D										1						
S.S. Santhia at Singapore from Hong Kong	C								P								
S.S. Baron Inchcape at Hong Kong	C										P						

Place		November 1932	December 1932	January 1933	February 1933			March 1933			April 1933			May 1933		
					1–10	11–20	21–28	1–10	11–20	21–31	1–10	11–20	21–30	1–10	11–30	21–31
Indo-China (see also table above)	C	180	213	253	29	98	60	167	83	120	107	159	163	58	48	
	D	51	45	58	16	33	28	55	30	45	31	30	50	21	14	
Syria: Beirut	C	41	49	34	11	8		2	11	7	3	35		7	9	4

Place		December 1932	January 1933	February 1933	March 1933	April 1933	May 1933
Chosen	C		7	17	30	4	34
	D		1	5	7	2	14
Ecuador	C						[2] 1
Greece	C			3	4	6	

Place		December 1932	January 1933	February 1933	March 1933	April 1933	May 1933
Guatemala	C					3	1
Morocco	C	81	14	14		23	14
Peru	C		38		7		
Turkey	C		5		1	3	

[2] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Dec. 11, 1932–Jan. 7, 1933	Jan. 8–Feb. 4, 1933	Feb. 5–Mar. 4, 1933	Week ended— March 1933 11	18	25	April 1933 1	8	15	22	29	May 1933 6	13	20	27	June 1933 3	10	17	24
Algeria:																				
Algiers Department	C		1	1			1	2			1	1	7	2	2	3	4			
Constantine Department	C		6	71	21	32	38	16	3	36	95	85	52	41	16	11	40	31	38	
Bone	C	1		1			2				3		1	1						
Oran Department	C																1			
Argentina: Buenos Aires	C		6																	
Bolivia. (See table below.)																				
British East Africa: Uganda	C	17	17	19	3	9								2	8		2			
Bulgaria	C	5	2	9	24	18	6			9			8					4		
Chile	C	223	152	133	23	30	26	23	34	33	37	33								
Antofagasta	C		1	1						1									1	
Santiago	C					1							34	30				25		
China: Hankow	C		3	5																
Czechoslovakia. (See table below.)																				
Egypt:																				
Alexandria	C	1	1							11	6	6	6	7	4	7	5	5	4	3
Beheira	C		40				43													
Cairo	C						2	4	1	10	19	12	14	15	12	12	9	12	7	6
Gharbiya	C				70															
Provinces	C	59	171	134		178												341	394	
Greece. (See table below.)																				
Guatemala. (See table below.)																				
Iraq: Baghdad	C							1			1			1		1	1		1	
Ireland: Belfast	C			1																
Irish Free State: Kerry County, Killarney district	C	5																		
Lithuania. (See table below.)																				
Mexico:																				
Mexico, D.F.	C	3	2	11	5	1	4	4			2	2	4	3	5	3	7	2		
San Luis Potosi	D						1													
Morocco	C	43	63	138	11	26	9		3	6	6	2	6	10	8	7	19	17	19	8
Palestine	C	1	1	2	1		2		1		1	1								1
Persia	C	16	16	40	9	4	2	13	19	18	13	19	24	10	5		7	6	8	
Peru. (See table below.)																				

Poland	C	152	277	350	91	93	64	87	92	87	73	103	100	98	98	82	96	76	75	------
	D	8	26	20	8	6	2	4	8	6	9	1	3	8	4	6	2	5	2	------
Rumania	C	254	219	276	61	63	66	88	67	65	41	65	68	74	64	------	------	------	------	------
Syria [1]	C	------	------	------	------	------	------	------	------	------	------	------	7	1	20	5	18	2	------	1
Tunisia: Tunis	C	9	35	34	2	10	24	9	4	17	26	------	9	3	20	9	7	36	5	12
Turkey. (See also table below:) Istanbul	C	3	5	1	3	------	1	------	------	1	------	------	------	------	------	------	------	------	------	------
Union of South Africa:																				
Cape Province	C	P	P	P	------	------	P	P	------	P	------	------	P	P	------	------	------	------	------	------
Natal	C	P	P	P	P	------	P	------	------	------	------	------	P	P	------	------	P	------	------	------
Orange Free State	C	P	P	P	P	------	P	P	------	P	------	------	P	P	------	------	P	------	------	------
Transvaal	C	P	P	------	P	------	------	------	------	------	------	------	------	------	------	------	P	------	------	------
Yugoslavia. (See table below.)																				
On vessels:																				
S.S. Munplace at New Orleans from Progresso	C	------	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
S.S. Chiloe at Antofagasta	C	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	1	------	------	------

Place		December 1932	January 1933	February 1933	March 1933	April 1933	May 1933
Bolivia	C	4	29	33	72	190	98
Czechoslovakia	C	------	------	13	9	------	------
Greece	C	15	10	2	3	3	------
Guatemala	C	3	6	9	11	14	8

Place		December 1932	January 1933	February 1933	March 1933	April 1933	May 1933
Lithuania	C	10	36	13	12	19	------
Peru	C	111	81	------	41	------	------
Turkey	C	14	23	11	8	12	15
Yugoslavia	C	11	35	125	12	------	------

[1] Under date of May 1, 1933, an epidemic of typhus fever was reported in Syria, in the Deir-el-Zor district.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		Dec. 11, 1932–Jan. 7, 1933	Jan. 8–Feb. 4, 1933	Feb. 5–Mar. 4, 1933	Mar. 5–Apr. 1, 1933	Week ended— April 1933				May 1933				June 1933			
						8	15	22	29	6	13	20	27	3	10	17	24
Brazil:																	
Ceara State:																	
Araripe	C			2													
	D			2													
Limoeiro	C								1								
	D								1								
Pernambuco State.[1]																	
Piauhy State	D	1															
French West Africa: Guinea	C		1														
	D		1														
Gold Coast	C			2						1		1					1
	D			2													
Guinea (Portuguese): Bissagos Islands	C		44														
	D		14														
Ivory Coast:																	
Bouafle	C																1
Gagnoa	C															[2] 1	
	D															1	
Senegal:																	
Bakel	C				1												
Dagana	C				1												
	D				1												
Podor	C				1												
St. Louis.[3]																	

[1] 1 case of yellow fever with 1 death was reported in Pernambuco State, Brazil, during June 1933.
[2] Suspected.
[3] On July 13, 1933, 1 death from an imported case of yellow fever was reported in St. Louis, Senegal.

UNITED STATES TREASURY DEPARTMENT

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The Injection of Mosquito Sporozoites in Malaria Therapy
A Seasonal Acute Conjunctivitis Occurring in the South
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Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 48 — AUGUST 4, 1933 — No. 31

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES[1]

June 18–July 15, 1933

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the PUBLIC HEALTH REPORTS, under the section entitled "Prevalence of Disease."

Poliomyelitis.—During the 4 weeks ended July 15, Massachusetts reported 3[illegible] cases of poliomyelitis, as compared with 2 and 32 for the corresponding periods of 1932 and 1931, respectively. Only a normal seasonal increase was reported from other States, and some reported decreases. The State of Washington reported 13 cases for this period last year, whereas this year there were no cases reported.

For the entire reporting area the cases totaled 188, which represented a 10 percent increase over last year and a 40 percent increase over the same period in 1929—a normal year. For this period in 1931 and 1930 the numbers of cases were 291 and 611, respectively. A survey of geographic areas shows that, owing to the large number of cases reported from Massachusetts, the incidence in the New England area was more than four times that of last year, but all other areas closely approximated last year's incidence.

Diphtheria.—The incidence of diphtheria continued to decline during the 4 weeks ended July 15 and compared very favorably with the incidence in recent years. The number of cases reported (1,732) was the lowest recorded for this period in the 5 years for which data are available. Texas, in the West South Central area, reporting 205 cases for the current period as against 119 for the same period last year, seemed responsible for the only increase over last year in any geographic area. Decreases in the other areas ranged from 10 percent in the Mountain and Pacific regions to 55 percent in the New

[1] From the Office of Statistical Investigations, U.S. Public Health Service. The numbers of States included for the various diseases are as follows: Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 47; diphtheria, 48; scarlet fever, 48; influenza, 38 States and New York City. The District of Columbia is counted as a State in these reports.

England States. In the South Atlantic States the incidence was the same as that of last year.

Scarlet fever.—The number of cases of scarlet fever (6,759) was less than 50 percent of the number reported for the preceding 4-week period. In relation to previous years the incidence was 10 percent below that of last year, approximately the same as in 1931 and 1929, and more than 40 percent in excess of the incidence during this period in 1930. In the South Atlantic States the number of cases (380) was the highest reported for this period in 5 years, and in the Mountain and Pacific areas the numbers of cases, 164 and 475, were 1.5 times the numbers reported last year. Considerable decreases were reported from some areas while in others the incidence followed that of last year very closely.

Typhoid fever.—The number of cases of typhoid fever (2,745) reported for the current 4-week period was more than twice that recorded for the preceding 4 weeks. A comparison with previous years shows that the incidence was slightly below that of last year (2,814 cases). It was approximately 600 cases above the average for this period for the 3 preceding years. The disease was most prevalent again this year in the East North Central and South Central areas.

Smallpox.—The reported incidence of smallpox approached more closely the incidence for a corresponding 4-week period last year than at any time during the current year. For the 4 weeks ended July 15 the number of cases was 424, as compared with 482, 1,675, and 3,111 for the same period in the years 1932, 1931, and 1930, respectively. The New England and Middle Atlantic States were entirely free from the disease, the East North Central, West South Central, Mountain, and Pacific areas reported increases over last year's figure, and the West North Central, South Atlantic, and East South Central areas reported appreciable decreases. Individual States showing considerable excesses over last year were Wisconsin, Texas, Colorado, and Oregon. For the country as a whole, the incidence continued to be the lowest in the 5 years for which data are available.

Meningococcus meningitis.—Illinois reported 30 cases of meningococcus meningitis for the current period, as compared with 8 and 11 for the corresponding periods of 1932 and 1931, respectively. Other States in the East North Central area, as well as in other sections, closely approximated last year's incidence. For the entire reporting area 145 cases were reported, as against 141, 244, and 347 for the years 1932, 1931, and 1930, respectively. For this period in 1929—the peak of the recent epidemic wave—there were 610 cases reported.

Measles.—Measles declined more than 50 percent during the current 4-week period from the preceding 4 weeks. The total number of cases (19,423) was about 75 percent of the number recorded for the corresponding period in each of the 2 preceding years. For this period

in 1930 and 1929 the numbers of cases were 29,215 and 23,099, respectively. In the New England, Middle Atlantic, and East North Central areas the incidence for the current period was considerably below that of last year, while the West North Central, South Atlantic, South Central, and Far Western regions reported very appreciable increases over last year. The reported incidence in the East South Central States was more than nine times that of last year, and in the West South Central section the number of cases (1,190) was more than five times last year's figure. California, reporting 1,782 cases for the current period as against 596 last year, seemed to be responsible for most of the increase in the Pacific area.

Influenza.—Influenza continued to decline, and for the current 4-week period the number of cases (936) was slightly below the average for the preceding 4 years. With one exception, the West South Central section, the incidence in all areas was below that of last year. The four States in the West South Central group reported 259 cases, 184 of which were from Texas, as against 158 last year.

Mortality, all causes.—The average death rate for all causes in large cities as reported by the Bureau of the Census for the 4 weeks ended July 15 was 9.9 per thousand inhabitants (annual basis). For this period in the years 1932, 1931, and 1930 the rate was 10, 11.2, and 10.8, respectively. The current rate is the lowest for this period in the 8 years for which data are available.

THE INJECTION OF MOSQUITO SPOROZOITES IN MALARIA THERAPY

By Bruce Mayne, *Special Expert, United States Public Health Service*

Malaria sporozoites isolated in suspended media from salivary glands of mosquitoes were kept for periods of 1 hour to 5 days and 1 hour and reproduced malarial fevers when injected intravenously into patients for the purpose of malaria therapy. The reactions and subsequent clinical histories appeared to be no different from those in cases treated with bites of infected anopheline mosquitoes.

The three species of Plasmodia—tertian, estivo-autumnal, and quartan—were thus successfully reproduced. The medium used in these instances consisted of sodium citrate alone or mixed with freshly drawn, defebrinated human blood, enriched with 1 percent of dextrose.[1]

[1] The blood drawn from a healtny donor immediately preceding the planting of the dissected salivary gland emulsion is thoroughly defibrinated in a sterile flask containing the measured quantity of 50 percent dextrose. It is distributed by means of a glass syringe in 15-cc rubber-capped serum bottles. Ten cc of blood mixed with 1 percent dextrose is the amount of medium usually employed. The salivary glands of the infected mosquito are flooded with one half cc of sterile 2 percent sodium citrate on the glass slide, drawn back into the syringe, then added to the blood by piercing the rubber cap. The serum bottles covered with sterile gauze are then placed in the electric refrigerator, where a temperature of 50° F. is constantly maintained.

In these tests all attempts at mixing the sporozoites with glycerine and sodium chloride treated in identical manner were unsuccessful. Sporozoites kept in suspended cultures at temperatures below 42° F. did not prove viable upon human transplantation.

In developing malaria therapy practical difficulties were encountered when mosquitoes were applied by biting. It was not feasible to forward live mosquitoes unaccompanied by an attendant for use by medical officers in hospitals or by private physicians, and the carriage of these insects by a special attendant over long distances by train was too costly. The transportation by mail of infective material in the form of gland sporozoites was next attempted. Here encouraging results were obtained, considering the value of time and the saving of material. After a preliminary test of a suitable medium for the maintenance *in vitro* of dissected-out sporozoites, an attempt was made to determine the length of time sporzoites from the insects' salivary glands may remain viable. More than 50 experiments were made, and the following table gives the data of the successful trials:

TABLE 1.—*Tabulation of data summarizing successful sporozoite inoculations*

Patient inoculated	Number of mosquitoes used	Interval following mosquito's first infective blood meal	Extent of sporozoite infection in mosquito	Medium used for gland suspension	Time sporozoites in vitro	Method of injection	Incubation period: Clinical	Incubation period: Parasite
PLASMODIUM VIVAX								
		Days					*Days*	*Days*
H.F.	1	17	Very numerous	2% sod. citrate	40 minutes	Subscapular	13	14
N.M.	1	19	Numerous	do	2½ hours	do	13	13
S.S.	1	35	Moderate	Dextrose blood	44 hours	Intravenous	14	16
E.J.	1	26	Numerous	2% sod. citrate	35 minutes	do	17	19
B.S.	1	24	Moderate	Dextrose blood	45½ hours	do	16	17
M.J.M.	1	33	Very numerous	do	21 hours	do	22	22
B.S.K.	1	33	do	do	3 days	do	21	21
E.R.D.	2	19	Moderate	do	22 hours	do	13	14
Do		19	Numerous	do	do	do		
F.B.	1	19	do	do	5 days, 1 hour	do	14	15
H.Z.	3	19	Few	do	do	Subscapular	20	20
Do		19	Moderate	do				
Do		19	Very scanty					
P. FALCIPARUM								
S.F.	2	40	Numerous	Dextrose blood	3 days, 6 hours	Intravenous	14	15
Do		40	do	do				
D.S.	2	37	Scanty	do	4 days	Intravenous	16	17
Do		37	do	do				
J.D.	2	22	Few	do	4 days	Intravenous	12	13
Do		22	do	do				
E.H.	3	23	Numerous	do	4 days	Intravenous	14	13
Do		22	do	do				
Do		22	Few	do				
L.B.	2	22	Scanty	do	4 days, 1½ hours	Subscapular	14	13
Do		22	Numerous	do				
P. MALARIAE								
B.K.	2	30	Moderate	2% sod. citrate	1 hour	Intravenous	32	33
Do		30	Numerous	do				

An analysis of the data presented in the table indicates the production of malaria in 16 patients injected with the contents of the salivary glands of one to three mosquitoes. In two instances successful injections resulted from the use of the sporozoites (of one mosquito) held *in vitro* at intervals of 1 to 3 days. In all the tests the suspended media were maintained uniformly at a temperature of 48° to 52° F.

In this report clinical incubation is interpreted as the occurrence of the first elevation of temperature (usually 102° F. and above), accompanied by a sharp paroxysm. Here the initial rise to 100° F. is not considered unless the characteristic rigor is present. Parasite incubation is defined as the first appearance of malaria plasmodia in a thick smear preparation.

It will be observed that usually the microscopic finding marks the termination of the incubation period 1 to 2 days following the onset of clinical symptoms. In several instances there is a recorded deviation in a protracted incubation. This is surmised to be due to the masking of symptoms on account of the associated specific infection present in this type of patient.

The clinical incubation periods developing from the inoculations, whether intravenous or intramuscular (subscapular), were 12 to 16 days in the estivo-autumnal strain, 13 to 22 days in the tertian, and 32 days in quartan. The parasite incubation was found to be 13 to 15 days in the estivo-autumnal, 13 to 22 days in the tertian, and 33 days in the quartan type.

For comparative purposes a similar group of 16 patients in whom malaria was induced by mosquito biting gives the following data:

TABLE 2.—*Group of general paralysis patients in whom malaria was induced through mosquito biting*

Patient bitten	Number of mosquitoes applied	Incubation period	
		Clinical	Parasite
PLASMODIUM VIVAX			
		Days	*Days*
A. S. A.	1	16	16
L. M. G.	1	12	13
R. G. H.	1	16	17
P. H.	6	18	18
W. D. I.	2	17	17
E. S.	5	17	18
J. W.	8	11	13
C. M. Y.	1	17	18
L. S.	2	15	16
M. H.	1	15	17
R. C. H.	10	16	17
M. M. L.	10	18	20
I. T.	3	22	23

TABLE 2.—*Group of general paralysis patients in whom malaria was induced through mosquito biting*—Continued

P. FALCIPARUM

		Days	*Days*
J. C	9	10	11
E. E	5	12	13

P. MALARIAE

		Days	*Days*
J. W	2	34	39

Here from 1 to 10 mosquitoes were applied and produced the disease in clinical incubation periods of 11 to 18 days with the tertian strain, 10 to 12 days in the estivo-autumnal, and 34 days in the quartan infections. Correspondingly, the parasite incubation was effected in 13 to 20 days for the tertian, 11 to 13 days for the estivo-autumnal, and 39 days for the quartan type.

Although there appears no valid objection to the use of wild mosquitoes for conveyance of malaria by biting, this does not hold for the injection method. In every instance it is aimed to employ only laboratory-bred anophelines when salivary gland suspensions are applied in malaria therapy.

In instances in which mosquitoes are known to harbor an unusually large number of parasites, it is found profitable to combine the conveyance of the infection through the biting of one patient and in another patient by inoculation with sporozoites, either immediately or after the blood meal is digested. This is a simple procedure where the practice is to insure infection through biting followed by immediate killing and dissection.

The extraordinary potentialities for producing infection with these organisms may be appreciated when it is recalled that a single mosquito which was instrumental in producing malaria by biting 10 or more persons, upon dissection of its salivary glands, revealed enough undischarged sporozoites to infect several more persons by intravenous transmission of these parasites.

THE RELATION OF TEMPERATURES

In numerous failures it was noted that temperatures in which the material was kept were apparently too low; when the infected forms were kept under 42° F. for as much as 1 week to 10 days, few, if any, infections were reproduced. This factor was considered in the present attempts. On the other hand, it was essential to maintain a low enough temperature to minimize the rapid growth of invading bacteria introduced with the drawn blood. It was found that a temperature of 48° F. to 52° F. was satisfactory in this regard.

PROCEDURE FOLLOWED IN ISOLATING THE GLAND SPOROZOITES

In these tests only the sporozoites from the salivary glands proved to be infectious in malaria reproduction, a substantial number of tests showing that sporozoites washed and suspended from the discharging gut oocysts were impotent for this purpose. The method consisted essentially in observing as strict asepsis as possible; all operations were conducted with scrupulous regard for surgical cleanliness, aiming to produce at least a reaction bacteriostatic in effect All glassware and instruments employed were rendered sterile, as were the solutions employed. The mosquito, following ether anesthesia, was immersed for 3 to 5 minutes in a solution of 1:100,000 merthiolate, then soaked in two changes of 2 percent sterile sodium citrate. Legs and wings were separated and salivary glands removed and examined microscopically. If found harboring sporozoites, the salivary glands were drawn up into a glass syringe and planted at once into a serum bottle containing the desired culture medium. For immediate transplantation the glands were directly transferred to the vein of the prepared patient; but if found desirable to keep the infectious material for a short period, the necessary defibrinated human blood, mixed with 1 percent of dextrose, was added. When it was required to transport the material by mail, a suitable bottle was kept chilled for 1 day, then the ice was removed to bring the temperature to above 42° F., and the prepared serum bottles were wrapped in cotton wool and placed in it. Ordinary mail was employed in shipping to a destination 2 days distant, while the facilities afforded by air mail were employed for longer distances. In this way we shipped with successful results preparations containing mosquito sporozoites from strains of *P. vivax* and *P. falciparum* from Columbia, S. C., to points as distant and as widely separated as Miami, Fla., Richmond, Va., and San Francisco, Calif. The time element involved in the successful inoculations was 22 hours and 45 hours, respectively, in the Richmond and Miami shipments, and 3 days and 6 hours in the case of the San Francisco shipment.

As a result of these successful trials, it is demonstrated that material can remain alive and be shipped to practically any point in the United States. Recently a sporozoite preparation maintained *in vitro* for longer than 5 days was successfully inoculated. The probability of a "take" should be greatly enhanced, since we are using an agent of known infectiousness.

PRACTICAL ASPECTS OF TRANSPORTING SPOROZOITE MATERIAL

The injection of sporozoite-seeded blood requires no more skill in the hands of the average physician than does the injection of malaria blood mixed with an anticoagulant. It affords all of the advantages of conveyance of malaria through mosquito biting, in addition to

being of greater economy in time and money. At present the only satisfactory method of distribution of mosquitoes is that of personal carriage and the attendance of a trained assistant. The former plan of utilizing the services of clinicians in various institutions to care for infected mosquitoes shipped at a distance was found unsatisfactory and unsafe.

CONTAMINATION OF SUSPENDED MEDIA

Except when administered in instances of chronic hepatitis and gastro-intestinal upset—admittedly contra-indications—no bad effects have been observed in nearly 50 inoculations of artificial media used in sporozoite suspensions. The reactions following intravenous injections resemble the rigor accompanying the injection of any foreign protein. Rarely the severity differs from similar injections of an equal quantity of citrated malaria blood. The presence of bacteria during a cultural period in intervals as long as 22 days while the infective protozoan organism is held in suspension is, of course, not unusual. Regardless of the nature of the material held, the presence of protein decomposition products would be inevitable.

A constant check was made, whenever feasible, of the microscopical appearance of the infectious material injected into the 16 patients used in these experiments. In this connection, the general impression was gained that, although bacteria were present, there was no greater contamination than would occur in similar material kept as control cultures, suggesting that the introduced mosquito tissue could not be held accountable.

Another reason for the numerous microscopical tests was the attempt to demonstrate the presence of sporozoites, either free or showing developmental change of form. In several instances, and only those in which sodium citrate was the medium used for gland suspension, fully formed sporozoites were revealed. After 3 hours these forms were never found. For this purpose many "hanging drops" and stained specimens prepared from the material left in the syringe following an injection were examined. Likewise, there were not present any organisms which might be interpreted as rings in blood used as culture medium up to a period of 22 days after sporozoites were planted.

In this connection it should be recalled that all media employed were maintained at an average temperature of 50° F., with the intention of inhibiting growth which might prove contaminative.

Bacteriological cultures made of a 5-day-old sporozoite suspension revealed the presence of Gram-negative bacilli and some staphylococci. This material was injected with a resulting immediate, though short-lived, reaction resembling anaphylactic shock which subsided within 4 hours.

However, this difficulty may be alleviated in intramuscular injections, by preference subscapular, which offers no greater disadvantages.

The advent of this inoculation reaction meets with no serious objection, when considering the desirability of producing controlled temperature elevations. The febrile reaction observed accompanying sporozoite suspension injection was not different from that produced in the administration of simple blood transfusion—the latter of untyped material in quantities under 10 cubic centimeters.

LITERATURE

Aside from the work of the Sergents, in Algeria, and my own efforts in India, in the routine injection of sporozoites dissected from culicine mosquitoes in reproducing bird malaria, the only investigations similar to the present were contributed by James, Nichol, and Shute (1927),[2] who, in a method of procedure to test the effect of quinine, to ascertain whether or not this drug is a preventive of malaria infection, injected sporozoites from mosquitoes harboring *Plasmodium vivax* into seven patients, producing malarial fever in each of them. The solutions used were blood serum and Locke's solution. The contents of the mosquitoes' salivary glands were crushed under the cover slip on a glass slide and, after remaining for 15 minutes, were injected with a hypodermic syringe. The resulting incubation period varied from 6 to 13 days.

ACKNOWLEDGMENTS

Grateful acknowledgment is made of the valuable cooperation of my assistant, Senior Medical Technician H. E. Hingst, whose meticulous zeal in the preparations of dissected mosquitoes and the scrupulous care of cultures made possible the success of our present undertaking.

I wish to express my indebtedness to Dr. Mark F. Boyd, of the Rockefeller Foundation, at the malaria research station in Florida, for his generous assistance in furnishing insectary-bred mosquitoes infected in the experiments recorded.

My grateful thanks are also due Dr. Charles Frederick Williams, superintendent, Dr. Eugene Leroy Horger, clinical director, and members of the staff of the South Carolina State Hospital for their stimulating aid in proffering unstintedly the facilities of that institution.

[2] James, S. P., Nichol, W. D., and Shute, P. G.: Note on a new procedure for malaria research. Trans Roy. Soc. Trop. Med. and Hyg., vol. XXI, no. 3, Nov. 1927, pp. 233-236.

SEASONAL ACUTE CONJUNCTIVITIS OCCURRING IN THE SOUTHERN STATES

By IDA A. BENGTSON, *Senior Bacteriologist, National Institute of Health, United States Public Health Service*

A seasonal acute conjunctivitis in which the infection is largely transmitted by the gnat *Hippelates pusio* Loew occurs in certain sections of the country, notably in southern Georgia, in Florida, in the Coachella Valley, Calif., and also in other parts of the South.

The condition in southern Georgia was brought to the attention of the United States Public Health Service in connection with trachoma eradication and prevention work during the years 1930–32. The writer, who was engaged in a study of the etiology of trachoma during this time, undertook a study of trachoma in Georgia with the purpose of ascertaining whether the results would be similar to those obtained in the study of trachoma in the State of Missouri. It was very soon observed that organisms resembling the Koch-Weeks bacillus were frequently present in the Georgia cases, whereas it had been found that organisms of this group were of such rare occurrence in Missouri as to be practically negligible.

A study of the situation in Decatur and Mitchell Counties led Dr. C. E. Rice, medical officer in charge of trachoma prevention, United States Public Health Service, to express the opinion that true trachoma is present in southern Georgia. This opinion was based on the clinical appearance and history of the cases. The presence of pannus and of conjunctival scar tissue supported this view. Some cases exhibited the well-known sequelae of the active trachomatous condition, i.e., trichiasis, entropion, corneal opacity, and occasionally blindness. In a number of the cases investigated, a family history of the affection was obtained. Certain of those examined, or their parents or relatives had been patients at the Pelham (Ga.) Trachoma Hospital during the two periods of its existence, November 1921 to April 1922 and April 1923 to August 1923. In view of these considerations it was felt that the presence of the Koch-Weeks bacillus indicated a superimposed infection on the trachomatous condition. In spite of this added infection, however, the cases on the whole were much milder than the Missouri type and yielded more readily to treatment.

It was learned in connection with the above studies that there was present in this section of the country a seasonal acute conjunctivitis which, on account of its widespread occurrence and probable transmission by the "eye gnat", was of rather serious consequence. This report is concerned primarily with a discussion of the acute affection, though the occurrence of the organisms concerned as probable secondary invaders in trachoma will be considered incidentally. A special

study of the subject was made in September 1932, at Bainbridge, Ga., at the instance of Dr. M. A. Fort, county health officer of Decatur County.

LITERATURE

Epidemics of acute conjunctivitis in the Coachella Valley of California in which the "eye gnat" is concerned as the probable vector have been described in this country by Schneider and by Herms.

Schneider designates the disease as "Coachella pseudo-trachoma." It is endemic in the Salton Sea regions of California, which is an irrigated area below sea level where the diurnal summer temperature ranges from 100° to 120° F., and where the annual precipitation is only ½ to 1½ inches. The disease is said to be at its worst in the early spring.

The conditions in the Coachella Valley have also been described by Herms, who visited that locality in 1926. He states that "during the past 10 years, *Hippelates* flies have become increasingly numerous until they are now a veritable pest, and, together with numerous cases of so-called 'pink eye' affecting the people of the valley and the known relation of this fly to the disease, there exists a really serious situation." According to physicians of long residence in the region the disease existed in this locality as early as 1912, and in 1920 and 1921 reached epidemic proportions. Attention is called to the seriousness of the disease from an economic standpoint and to the large number of absences of children from school.

The occurrence of the "eye gnat" and its connection with "sore eyes" has been referred to by L. O. Howard and E. A. Schwarz in publications of the Bureau of Entomology of the United States Department of Agriculture. In discussing the occurrence of gnats under the title, "The Hippelates Plague in Florida", Schwarz states that the flies are particularly numerous in Florida but have also been encountered in Alabama, Texas, and Virginia. The United States Bureau of Entomology is at present engaged in a study of methods for the control of the pest in the Coachella Valley region.

The role of flies and gnats in the spread of eye diseases is recognized in other parts of the world. A recent publication by Ranganatha Rao reports the results in a study of 1,000 cases of acute conjunctivitis in Bangalore, India. The seasonal epidemic starts about the middle of May, reaches its height in June or July, and recedes to the preepidemic level about the first of November. The Koch-Weeks bacillus was found in about 60 percent of the cases and a few cases showed the pneumococcus and streptococcus. Ranganatha Rao considers mango gnats and house flies as agents for the transmission of the disease, but believes that the majority of the cases are due to direct transmission between members of the family. He therefore

considers that the observation of individual hygiene is more imperative than public health measures against the gnats and flies, though he considers the latter also important.

In a recent publication, reviewing the literature of *Oscinidae* (Diptera) as vectors of conjunctivitis, Graham-Smith refers to Ayyar, who considers Siphunculina (*Siphonella*, *Microneurum*) *funicola* de Meijere, 1905, the "eye fly" of India, Ceylon, and Java as responsible for transmitting certain forms of ophthalmia occurring in the countries named. In Egypt and other countries of northern Africa also, flies belonging to this family are very common, and it is believed that they are concerned in transmitting both trachoma and acute conjunctival conditions. It has been suggested that the *Hippelates* of the Coachella Valley were imported with date shoots from northern Africa.

THE "EYE GNAT" IN GEORGIA

The gnat encountered in southern Georgia has been identified by Dr. J. M. Aldrich of the United States National Museum as *Hippelates pusio* Loew. It makes its appearance about May and continues its activities until the first frost in the fall. The evidence points to this fly as largely responsible for the seasonal occurrence of the disease known in the common parlance of that section of the country as "gnat sore eyes." The incidence of the disease is somewhat limited in adults but well nigh universal among young children.

The annoyance from the gnats is so great in some of the schools that half sessions only are held during the first several weeks of the school year. On entering some of the school rooms one is struck by the constant fanning with the hands to keep the gnats away from the eyes. They are particularly noticeable around the eyes of children in whom there is a discharge. They alight at the inner canthus of the palpebral fissure, where the discharge usually accumulates, or on the margin of the lids, where they burrow into the lashes and appear to be feeding. Sometimes they find their way into the eyes and are carried into the cul-de-sac of the lower lid. It is not unusual to find several dead gnats in the eyes of the young children who are quite unaware of their presence. The disease in some seasons occasions a greater number of absences from school than any other one cause.

HABITS AND DEVELOPMENT OF THE EYE GNAT

A study has recently been made by Hall of the habits, breeding media, development, and stages of *Hippelates pusio* Loew. It measures about 2 millimeters in length. The greatest annoyance from the gnats is observed on warm and humid days. They are attracted to places where moisture is abundant and seem to have a highly developed olfactory sense. The life cycle was studied under

insectary conditions and it was found that the complete development from egg to adult could take place in 11 days, though sometimes as long as 3 months was necessary. The average length of time was 18.5 days. The average incubation period of the eggs under proper moisture conditions was 3.7 days, and the length of the larval period ranged from 5 to 46 days, depending on the medium, moisture, and temperature. The average pupal period was 9.8 days. A study was made of various media suitable for larval development. Human excrement proved to be the most favorable medium. Decaying fruit and vegetables were less favorable As a result of his studies, Hall suggests that the problem of control of the eye gnat is one of sanitation as well as of agricultural practice.

INCIDENCE OF THE DISEASE IN THE LOCALITIES STUDIED

Through the cooperation of the United States Public Health Service, State and county health officials, and the principals and teachers in the schools of the counties in which the investigation was undertaken, information was obtained in regard to the incidence of the disease during September 1932. It seemed to be generally conceded that the disease had been less prevalent that year than in some former years. The opinion was expressed by some that the cases were fewer than they had been earlier in the summer, though it was stated by some of the principals and teachers that the disease had spread in the schools. The latter seems probable, as the close contact of the children and the presence of numerous gnats in some of the schools afforded ample opportunity for the conveyance of the disease from one child to another. The accompanying figures show the incidence of the disease and the absences resulting therefrom. Rather complete figures were obtained from Decatur, Mitchell, and Early Counties, and less complete from Grady, Baker, and Miller Counties.

Incidence of "gnat sore eyes" in certain Georgia counties

County	School enrollment	Number of cases	Number of absences	County	School enrollment	Number of cases	Number of absences
				Baker	327	92	47
Decatur	2,435	629	235	Grady	371	50	41
Mitchell	1,928	256	86				
Miller	1,482	273	138	Total	8,090	1,633	701
Early	1,547	333	154				

Based on these figures the incidence of cases of the disease was 20 percent of the school enrollment. Of the 1,633 cases approximately 43 percent were absent from school for longer or shorter periods.

Information on several other points was sought in the questionnaires sent the teachers. They were asked whether in their opinion the

condition was more or less prevalent than in former years. Fifty-one stated that it was more prevalent, and 121 that it was less prevalent. In answer to the question whether it had been observed that the pupils suffered repeated attacks from year to year, 112 replied in the affirmative and 50 in the negative. Treatments in the schools were carried out by 157 teachers, while 45 gave no treatments. Two hundred and two teachers reported that the eye condition ceased with cold weather, and 17 reported that it did not.

DESCRIPTION OF THE DISEASE

The disease presents the appearance of an acute conjunctivitis, varying in severity from a mild type to a very severe type which, in gross appearance, may at times assume a character simulating gonorrheal ophthalmia. However, the chemosis of the conjunctiva seen in the latter disease is not present. The palpebral conjunctiva is inflamed, and the bulbar conjunctiva may be blood-shot often to the extent that the whole of the sclera appears deep red in color. There may be a moderate amount of edema of the lids and a purulent discharge which accumulates so that in the morning the lids are glued together and the eyes can be opened only with considerable difficulty. During the day the discharge may sometimes be seen running down the face. In the very severe cases, the edema is so great that the eyes remain closed, and the discharge is so copious that when the lids are forcibly separated it exudes in a stream. In these severe cases, after the acute condition subsides, the eyelids as well as the surrounding tissues are discolored, the eye presenting an appearance of having been bruised as from a severe blow. Corneal damage does not occur in this locality as a result of this acute eye infection alone.

BACTERIOLOGICAL STUDIES

The unusual severity of some of the cases seemed to warrant a bacteriological investigation of the condition with a view to determining whether any other species of bacteria than those usually concerned in acute conjunctivitis might be encountered.

Epidemics of acute conjunctivitis are usually caused by the Koch-Weeks bacillus, the Morax-Axenfeld bacillus, or the pneumococcus. In the central area of this country the pneumococcus appears to be the chief cause of conjunctivitis. It was found to be the cause of an epidemic studied by the writer in Rolla, Mo. The disease in that locality was much less severe than that seen in Georgia. Gifford observed pneumococcus conjunctivitis very often in Nebraska. An extensive outbreak of conjunctivitis occurring at Camp Sherman during the war was studied by Kershner and was shown to be due to the pneumococcus. Conjunctivitis in the State of New York was first shown by Weeks to be due to the organism which bears his name.

McKee, on the other hand, reports that in many hundreds of examinations extending over a number of years in Montreal, Canada, the Morax-Axenfeld bacillus was found most frequently and the Koch-Weeks bacillus and influenza-like bacilli much less often.

Numerous reports have been published on epidemic conjunctivitis in various other parts of the world. The causative organisms in the epidemics occurring in Egypt and northern Africa are the Koch-Weeks and Morax-Axenfeld bacilli. Wilson regards Morax-Axenfeld conjunctivitis as much less serious than Koch-Weeks conjunctivitis. Koch-Weeks bacilli and gonococci as complicating factors in trachoma are believed to be responsible for at least 75 percent of the blindness in Egypt. Koch-Weeks conjunctivitis is of frequent occurrence in central Europe. In conjunctivitis studied at the eye clinic in Vienna, Pillat found that nearly twice as many cases were due to the Koch-Weeks bacillus as to the pneumococcus.

EXPERIMENTAL INVESTIGATION

A number of consolidated schools and a few 1-teacher schools, 11 in all, as well as some homes, were visited for the purpose of obtaining cultural material. A sterile cotton swab was rubbed over the surface of the conjunctiva of the lower lid, particularly in the neighborhood of the inner canthus, and the material thus collected was streaked lightly over the surface of blood agar plates. This method was found superior to any other as the cotton picked up large numbers of the surface organisms. After streaking the plate, the cotton swab was immersed in a tube of blood broth. Some of the discharge, when abundant, was used for purposes of cultivation. A microscopic examination was made of the discharge in a certain number of cases.

Abundant growth usually appeared along the streaks on the blood agar plates after incubation for one or two days at 37° C., and subcultures were made to tubes of blood agar or blood broth. The use of blood broth for primary cultures was discontinued in the latter part of the work when it was found that its use was of no special advantage.

The organisms most frequently isolated were the Koch-Weeks or a similar organism, the Morax-Axenfeld bacillus, and a pleomorphic streptococcus. In a number of cases the usual staphylococci and *C. xerosis* or other Gram-positive diphtheroids were present. Occasional colonies of other organisms were found from time to time which, on account of their small numbers, were not considered significant. In a few of the cases from homes where the sanitary conditions were particularly bad, a variety of species were present, including forms which were undoubtedly saprophytic. The predominant organism was the Koch-Weeks bacillus, which often occurred in pure culture; and it would seem, therefore, to be the one primarily concerned in the disease.

The organisms present in the 50 cases studied in September 1932 were as follows:

Koch-Weeks bacillus	40 (80 percent)
Morax-Axenfeld bacillus	9 (18 percent)
Pleomorphic streptococcus	12 (24 percent)

The Koch-Weeks bacillus occurred as a rather small Gram-negative rod, though long filamentous forms and swollen and pleomorphic forms were seen frequently. It was considerably larger than the *Bact. granulosis* isolated by Noguchi from trachoma. All the cultures were definitely hemoglobinophilic and required frequent transplanting to maintain viability. This is in marked contrast to *Bact. granulosis*, which grows on media without blood and which remains viable for long periods of time.

In using the term Koch-Weeks bacillus it is recognized that formerly the organism designated as Koch-Weeks was differentiated from Pfeiffer's influenza bacillus on the basis of variation in morphology, pathogenicity for laboratory animals, and growth properties. The present tendency is to consider them as belonging to the same species rather than as distinct species.

A few of the strains tested on guinea pigs and mice were shown to be pathogenic. None of the strains reduced nitrates to nitrites and none produced indol. No change in reaction was produced in a mixture of litmus milk and heated blood broth.

The Morax-Axenfeld organism corresponded with the classical type as described by Morax and Axenfeld. It is a thick Gram-negative bacillus, but at times highly pleomorphic. It produced the characteristic liquefied areas on the surface of Loeffler's serum slants.

The pleomorphic streptococcus was not abundant, although it occurred in a number of cases. Occasional colonies appeared on the plates in the streaks of the numerous closely crowded colonies of Koch-Weeks or Morax-Axenfeld bacilli. The organism was strikingly pleomorphic exhibiting in the same chain small typical coccus forms and very large, swollen lanceolate forms which took the stain more deeply. These cultures all produced a flocculent growth, which was precipitated in the bottom of the tube. The cultures were not bile soluble and did not ferment inulin. Of interest was the property of completely decolorizing cooked blood agar medium. The organism was pathogenic for mice in doses of 1 cc of 24-hour blood broth culture, but not in smaller doses.

Attempts were made to isolate the Koch-Weeks bacillus from gnats collected from the neighborhood of the eyes of children having the disease. On account of the presence of numerous saprophytic organisms which grew on the plate, it was not possible to demonstrate the delicately growing Koch-Weeks organisms. *C. xerosis* was isolated,

however. It is probable that the Koch-Weeks organism could be easily demonstrated if gnats bred under aseptic conditions were used experimentally. It seems likely also that the organism could be demonstrated on gnats associated with suitable cases in which there was a very large amount of purulent discharge. Cases of such severity were not found in the schools, however.

The organisms described in acute conjunctivitis were also encountered in some of 74 cases of trachoma and 6 cases of folliculosis seen in southern Georgia in 1930 and 1931, at which time a special study was being made of trachoma. Probably such cases have had the acute infection above described, and the bacteria associated with it continue to be present on the conjunctiva for longer or shorter periods after the acute condition has subsided.

Preliminary to the selection of suitable cases of trachoma for study by the methods of Noguchi, in which follicular contents or tissue is utilized, the methods described above for the study of the cases of acute conjunctivitis were used. Sterile cotton swabs were rubbed over the surface of the conjunctiva and streaked on blood agar plates. The growth obtained thus corresponded in a number of cases with that obtained in the cases of acute conjunctivitis. The organisms isolated by this method were as follows:

Organism	Trachoma	Folliculosis	Organism	Trachoma	Folliculosis
Koch-Weeks bacillus	23 (31%)	4 (66%)	Pleomorphic streptococcus	26 (35.3%)	2 (33%)
Morax-Axenfeld bacillus	5 (6.8%)	0	Pneumococcus	4 (5.4%)	0

It may be stated incidentally that cases of trachoma in Missouri usually yielded only *C. xerosis* and occasionally staphylococci when the cotton swab method of collecting material was used, and this was true in a few of the Georgia cases.

Twenty-two of the above trachoma cases were studied intensively by the methods of Noguchi for the isolation of *Bact. granulosis*. Follicular contents removed by means of Noyes forceps were planted in Leptospira semisolid media and on horse blood agar carbohydrate plates. *Bact. granulosis* was not cultivated. In a group of 10 cases studied, 2 small Gram-negative rods which were nonhemoglobinophilic were consistently isolated, and one of these resembled Noguchi's organism rather closely but differed in its serological behavior and in other respects. One occurred in 8 cases and the other in 9 cases. Neither of the two produced a granular condition in *Macacus rhesus* monkeys when inoculated subconjunctivally, though repeated attempts were made to accomplish this.

In addition to the above-mentioned organisms, all colonies which might possibly be *Bact. granulosis* were considered, even though only

one or two appeared on a plate. Seven different Gram-negative nonhemoglobinophilic rods were thus obtained which could not be identified definitely with any species described. These were of such rare occurrence that their significance is doubtful.

CONTROL

Control measures may be considered from two angles—that of treatment and of sanitation.

Treatment.—As part of the program for the eradication of trachoma and other communicable eye diseases, the United States Public Health Service, in cooperation with the State and county health officials, maintained treatment clinics at central localities during 1931 and 1932, and treatments were given in the schools by county health officers, special nurses of the Public Health Service, county health nurses, and the teachers. While intended primarily for the treatment of trachoma and suspected trachoma, the treatment used has been helpful in reducing the number of acute eye conditions. The teachers were generally of the opinion that the situation in the schools had improved greatly since treatments were instituted. The routine measures used were irrigations with zinc sulphate boric acid mixture (0.125 gm $ZnSO_4$ and 3 gm boric acid to 100 cc of distilled H_2O).

Sanitary measures.—Suggestions by workers of the United States Bureau of Entomology looking to the control of the gnat pest in the Coachella Valley in California are probably applicable to the situation in other localities. The removal or treatment of substances around human habitations which attract gnats and flies are steps in the problem of control. Adequate garbage disposal, suitable privy facilities, the clearing out of heavy vegetative growths and piles of trash and vegetable wastes are effective means for eliminating or reducing the number of breeding places of the gnats. Personal hygienic measures, including the liberal use of soap and water on the face and hands, are self-evident measures useful for preventing the spread of the disease from one individual to another.

SUMMARY

A seasonal acute conjunctivitis occurs in the summer months in Georgia and also in other parts of the South and in California. The eye gnat *Hippelates pusio* Loew appears responsible to a large extent for the spread of the disease. The incidence of the disease is greatest among young children.

An organism corresponding with the Koch-Weeks bacillus is the principal organism concerned in the disease in Georgia. The Morax-Axenfeld bacillus, the pneumococcus, and a pleomorphic streptococcus were present in some of the cases.

Control measures consist in treatment of cases in the schools as well as in the homes, personal hygiene, and sanitary measures concerned with eradication of the breeding places of the gnats.

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PHYSICAL IMPAIRMENT AND WEIGHT

A Study of Medical Examination Records of 3,037 Men Markedly Under or Over Weight for Height and Age [1]

By Rollo H. Britten, *Senior Statistician, United States Public Health Service*

I

The relation of health and weight has long been of peculiar interest to the medical profession and the vital statistician. In 1913 the Medico-Actuarial Mortality Investigation made a special report on the effect of weight in relation to the mortality of men and women;[2] and since that time many studies have been conducted in this field, dealing both with mortality and with physical impairment. However, no extended research into the physical condition of the general population in relation to weight has been made. The purpose of this paper is to summarize briefly the results of such a study. To cover so broad a field it will be necessary to omit discussion of the medical implications of the material, and also to consider only rates for impairments where obvious relationships are found.[3]

[1] Studies in the Diseases of Adult Life, No. 10, from the division of research, Milbank Memorial Fund. The study was made in cooperation with the United States Public Health Service. Previous articles in the series will be found listed at the end of this paper.

[2] Medico-Actuarial Mortality Investigation, 1913, vol. 2 Actuarial Society of America and Association of Life Insurance Medical Directors.

[3] The original data are on file for consultation in the offices of the Milbank Memorial Fund, New York City.

Weight changes so rapidly with height and age that a method must be devised to hold these factors constant. A custom has grown up of determining the weight status of the individual by subtracting the average weight of persons of his height and age from his actual weight, and expressing the result in terms of the number or percentage of pounds below or above the average. In view of the fact that in this study the numbers are insufficient to determine the rates of impairment for specific weight-height-age groups, this customary method has also been followed here. It will be realized, of course, that such a calculation makes no allowance for differences in the type of build. No satisfactory means has been found by which the bony structure of a person (as distinguished from his weight) can be objectively determined. This point will be referred to later.

The data available for the present analysis are the records of "health" examinations of life insurance policyholders, which have been reported on in a series of papers on the diseases of adult life. A list of these papers is given at the end of this article. Special reference should be made to the first paper in the series, since it included a detailed discussion of the nature of the material and the necessary qualifications in its interpretation. The group under consideration is composed of policyholders who have accepted the offer of certain life insurance companies for examination without cost by physicians of the Life Extension Institute. The examinations must, of course, be clearly differentiated from those given by the insurance companies' examiners to applicants for insurance. The section of the population under consideration is evidently a socially and physically selected one (i.e., accepted for insurance); but from the point of view of the present investigation this would not seem to be an important factor.

Reference should be made to a previous analysis of a relatively small group of examinations of the same character.[4] Tables were given showing the percentage of men with arterial thickening, varicose veins, and various urinary impairments among persons 20 percent of more overweight and among those of "normal" weight. Distribution of individuals as to blood pressure in relation to weight was also given. The difficulty noted in that and in other studies has been the fact that relatively small deviations from average weight do not appear to have much effect upon the rate of impairment, or, indeed, upon mortality. It therefore seemed desirable in this study to center attention on classes showing more marked deviations from the average. This was possible in view of the fact that selection could be made from 100,000 examinations. The classes used for study were the following: (a) 20 percent or more under the standard weight for the individual's

[4] Physical Defects as Revealed by Periodic Health Examinations. By L. I. Dublin, E. L. Fisk, and E. W. Kopf. Am. Jour. Med. Sci., Oct. 1925, no. 4, vol. CLXX, p. 576.

height and age; (*b*) all weights; (*c*) 30 to 39 percent over the standard; and (*d*) 40 percent and more over the standard. About 8 percent fell in the under- and over-weight classes. Because a change in the weight code was made in 1923, it was necessary to discard for this particular study examinations coded prior to that time. The all-weight group covers the whole period, the figures being taken from "Studies in the Diseases of Adult Life, No. 2." In order to compare young and old adults, two age groups, 30 to 39 and 45 to 64, are considered. The study was limited to men, as the number of women available was too small for analysis. Examinations made by physicians outside the "head" offices are utilized, because of the larger number available.

There has recently been published a report of the results of an extensive investigation by insurance companies into the relationship between weight and mortality.[5] The first table is taken from this report and gives, for four age groups, the ratio of actual to expected mortality in different weight classes, as determined at the time of application for life insurance. The expected mortality was derived by applying standard rates of mortality (according to age and length of the policy) to the number of insured persons in the various weight classes. Thus we are really dealing with ratios between annual mortality rates which have been adjusted for age and for duration of the policy.

TABLE 1.—*Ratio of actual to expected mortality according to weight status, in four age groups, 1909–1928. Men* [1]

Weight class	Age group			
	20-9	30-9	40-9	50+
Under—				
25 pounds or more	118	105	83	77
10 to 20 pounds	101	94	76	85
5 pounds under to 5 pounds over	92	84	87	92
Over—				
10 to 20 pounds	90	88	94	90
25 to 45 pounds	113	123	125	119
50 pounds and more	163	143	144	180

[1] From Supplement to Medical Impairment Study. Op. cit.

The ratios in this table will be found to be quite consistent with those published in the investigation of 1913; namely, a great excess of mortality among overweight persons whatever the age and also an excess among young adult underweight persons. By the time that middle age is reached, these figures indicate, it is a definite advantage to be under the average weight for height.

[5] Supplement to Medical Impairment Study, 1929. Actuarial Society of America and the Association of Life Insurance Medical Directors, New York, 1932. See also The Influence of Weight on Certain Causes of Death. By Louis Dublin. Human Biology, vol. II, no. 2, May 1930.

Of more importance in connection with the present study is the mortality from particular causes among people of different weight classes. In table 2 are given the annual death rates in three categories; (a) 25 pounds or more under the average weight for height and age; (b) standard lives; (c) 50 pounds or more over the average. Since in many cases the experience is quite limited, the number of deaths is included in the table. The comparison is confined to 14 major causes of death.

TABLE 2.—*Annual death rates by cause, according to weight, in three age groups at issuance of insurance, 1909–1928.*[1] *Men*

	Weight class [2]	Annual rate per 100,000			No. of deaths		
		10–29	30–44	45 and over	10–29	30–44	45 and over
Tuberculosis of lungs	a	96	94	67	116	83	19
	b	42	30	30	1,121	258	78
	c	19	4	10	13	6	6
Other tuberculosis	a	7	9	21	8	8	6
	b	6	3	4	146	28	9
	c	0	1	0	0	2	0
Cancer and other malignant tumors	a	17	49	175	20	43	50
	b	6	37	152	154	321	392
	c	9	34	176	6	57	109
Pneumonia	a	26	61	102	31	54	29
	b	26	38	83	694	334	213
	c	34	44	64	23	73	40
Typhoid fever	a	5	7	7	6	6	2
	b	8	6	6	218	52	16
	c	7	11	6	5	18	4
Suicide	a	9	18	35	11	16	10
	b	9	21	33	251	184	85
	c	9	16	37	6	26	23
Accident	a	29	55	84	35	49	24
	b	80	55	75	2,107	481	194
	c	56	59	77	38	98	48
Influenza	a	20	27	42	24	24	12
	b	28	31	31	754	269	79
	c	92	47	35	62	79	22
All other causes	a	68	157	399	84	139	114
	b	61	152	451	1,601	1,324	1,160
	c	129	181	473	86	303	293
Organic diseases of the heart	a	10	26	161	12	23	46
	b	7	39	213	180	336	548
	c	10	71	253	7	119	157
Appendicitis, typhlitis	a	12	12	14	15	11	4
	b	14	18	25	379	157	63
	c	33	29	43	22	48	27
Cirrhosis of liver	a	1	2	7	1	2	2
	b	0	4	23	13	39	58
	c	1	16	31	1	26	19
Nephritis and Bright's disease	a	6	25	109	7	22	31
	b	7	33	123	186	289	317
	c	27	63	171	18	105	106
Diabetes	a	3	3	18	4	3	5
	b	4	8	25	104	66	64
	c	15	19	35	10	31	22
Cerebral hemorrhage and apoplexy	a	2	8	67	3	7	19
	b	3	27	118	75	232	303
	c	12	34	156	8	56	97

[1] From Supplement to Medical Impairment Study, 1929. Op. cit.
[2] Weight classes: (a) 25 pounds or more under; (b) standard lives; (c) 50 pounds or more over.

Of the diagnoses under consideration, tuberculosis is the only one showing any marked excess mortality among underweight persons. On the other hand, a large number of causes of death, primarily degenerative in nature, show an excess among overweight persons.

The table will serve as a key to the type of condition which, in our study of impairments, we may expect to find associated with overweight. But it is necessary to note that some of these conditions would not be likely to manifest themselves on the physical examination because of their very nature (for instance, cerebral hemorrhage). Moreover, the examinations being analyzed are those of persons able to be about; therefore, persons suffering from severe degenerative diseases are not likely to appear in the records.

II

Turning now to the results of the present investigation, we give (table 3) the average weights used as a standard in calculating the weight status of the individuals and (table 4) the percentage distribution of the men examined according to this weight status. In the latter case the comparison is limited to one particular, large, occupational group (that referred to in previous articles in this series as "business"). Tabulations for the intermediate weight classes were made for this group only.

TABLE 3.—*Average weight of men for height and age* [1] (*average for 30 years is taken as standard for later years*)

Height		Age			
Feet	Inches	15	20	25	30
5	0	107	117	122	126
	1	109	119	124	128
	2	112	122	126	130
	3	115	125	129	133
	4	118	128	133	136
	5	122	132	137	140
	6	126	136	141	144
	7	130	140	145	148
	8	134	144	149	152
	9	138	148	153	156
	10	142	152	157	161
	11	147	156	162	166
6	0	152	161	167	172
	1	157	166	173	178
	2	162	171	179	184
	3	167	176	184	190
	4	172	181	189	196
	5	177	186	194	201

[1] Medico-Actuarial Morbidity Investigation Op cit.

Perhaps the only comment necessary in regard to this table is that the averages at age 30 have been taken as the standard for all later ages. Average weights after 30 years show a gradual increase, which accounts in part for the fact that, in the next table, there is found, with advancing age, an increasing percentage of persons in the overweight groups. In the present analysis, however, since attention is being focused on individuals 30 percent and more overweight, no serious difficulty results from this basis of calculation.

TABLE 4.—*Percentage distribution of men according to weight status, by age. "Business"*

Percent under- and over weight	Age			
	20–9	30–9	40–9	50–9
Under—				
30	0.1	0.1	0.1	
20 to 29	3.1	2.8	2.0	1.8
10 to 19	21.7	17.2	11.7	9.6
5 to 9	18.4	14.3	11.0	9.9
4 percent under to 4 percent over	29.5	26.2	24.5	22.3
Over—				
5 to 9	9.8	11.7	13.1	13.8
10 to 19	10.7	15.7	19.7	21.8
20 to 29	4.6	7.6	11.5	13.4
30 to 39	1.3	3.1	4.4	4.8
40 and over	.9	1.2	2.0	2.6
Persons	7,256	12,124	7,791	4,164

The examiners attempted to classify persons according to their bony framework or type of build. Three categories were used: Light, medium, and heavy. At first it seemed that this classification would give added meaning to a person's weight status, for it is recognized that bony structure is an important factor in weight status; but the following findings indicate that the physicians were unable to make the necessary distinctions:

(1) The percentage distribution of men according to type of build was not consistent at different ages. Instead, there was a marked increase in those classified as "heavy" as age advanced. This is brought out in table 5.

TABLE 5.—*Percentage distribution of men according to "type of build", by age, for occupational group, "Business"*

Build	Age			
	20–29	30–39	40–49	50–59
Light	10.1	7.9	7.4	5.7
Medium	83.6	82.7	80.8	81.2
Heavy	6.3	9.4	11.8	13.1
Persons	7,287	12,184	7,875	4,181

(2) There was a great excess of persons classified as "heavy" in the overweight groups, and vice versa. This is shown in table 6.

TABLE 6.—*Percentage distribution of men according to weight status by "type of build", age 30–39. "Business"*

Weight status	Type of build		
	Light	Medium	Heavy
Under—			
20 percent+	11.6	2.4	.5
10–19 percent	46.7	16.2	2.7
10 percent under to 19 percent over	39.9	72.3	55.4
Over—			
20–29 percent	1.2	6.6	22.6
30–39 percent	.5	2.2	13.6
40 percent+	.1	.1	5.0
Persons	944	10,049	1,131

(3) Preliminary calculations of the gross impairment rates according to weight status and type of build did not show the internal relations which would be expected if the classification by type of build really depended on bony structure rather than on appearance or on weight itself. For instance, in table 7 are given the number of impairments per person in two classes: (I) Those which show a decrease as weight increases, and (II) those which show an increase with weight.

TABLE 7.—*Impairments*[1] *per person (I) decreasing as weight increases, (II) increasing as weight increases; by type of build and weight status, age 30–39*

Weight status	I			II		
	Light	Medium	Heavy	Light	Medium	Heavy
(a) 20 percent or more under	2.65	2.51		1.80	1.64	
(c) 30 to 39 percent over		1.61	1.52		2.34	2.59
(d) 40 percent or more over		1.42	1.60		2.57	2.89

[1] Items included are those given in tables 11 and 12.

If the type of build classification is to be taken as having any meaning apart from weight status, we would expect that, for persons of the same weight status, those impairment rates which decrease as weight increases would be higher in the medium than in the light type of build, and in the heavy than in the medium. In the case of impairments increasing with weight, we would expect the opposite. The table shows clearly that these relations do not hold.

(4) Calculations for systolic blood pressure, which is very sensitively associated with changes in weight status, indicate the same point that has just been brought out. Although it does not seem necessary to present the data in detail, table 8 is given for a particular weight class.

TABLE 8.—*Average*[1] *systolic blood pressure, 20 to 29 percent over average weight, by type of build and age. "Business"*

Type of build	Age		
	20-29	40-49	50+
Medium	125	129	136
Heavy	126	130	141

[1] See text footnote 8.

One factor which tends to invalidate comparisons of the rates of impairment among underweight and overweight persons is the difficulty which the examiner experiences in determining the presence of certain conditions among the latter. A few of these impairments are listed in table 9, which gives the ratio of the rate among persons

30 percent or more over the average weight to that in the group 20 percent or more under the average. Two age groups are shown.

TABLE 9.—*Impairments showing less prevalence among overweight persons due to difficulty in palpation or auscultation*

Impairment	Ratio of rate among persons 30 percent or more over average weight to that in group 20 percent or more under average		
	Mean	Age 30-39	Age 45-64
Spinal curvature	23	29	17
Faulty posture	32	27	38
Organic valvular lesions	41	24	58
Lymphadenitis	43	24	62
Abdominal tenderness [1]	43	35	52
Weak inguinal rings	44	59	29
Visceroptosis	46	34	58
Arterial thickening	55	59	52
Functional heart murmur	70	59	83

[1] Tenderness in region of appendix, liver, or gall bladder.

None of these ratios even approximate 100 (which would mean equal rates in the underweight and overweight persons), even where we would anticipate finding higher rates among overweight persons. Although in some cases it is possible that the relations shown in the table are real, it is evident that we cannot eliminate the factor of difficulty of discovery of impairments in the overweight group. Accordingly, these conditions have been omitted from consideration in this paper.

III

Because of large numbers of insignificant impairments and of conditions very slight in degree in the particular case, it is impossible to establish any impairment rate which is comparable with a mortality from all causes. However, it does seem worth while to present the gross rate of impairments or symptoms per person according to weight. This is done in table 10. The impairments listed in table 9 are omitted. Urinary findings are not included.[6]

TABLE 10.—*Impairments per person according to weight status. Two age groups*

Weight status	Per person		Total number	
	30-39	45-64	30-39	45-64
(a) 20 percent or more under	4.4	5.5	2,925	1,672
(b) Total group	4.0	4.8	129,680	98,142
(c) 30-39 percent over	3.7	4.6	2,290	3,595
(d) 40 percent or more over	3.7	4.8	1,009	1,904

[6] Items which are not strictly impairments (such as dietary faults, habitual use of laxatives, etc.) and history of previous illness are also excluded.

In both age groups there is a slight excess of impairments in the underweight class; in neither age group is there any excess in the overweight class. At first glance these rates appear to be inconsistent

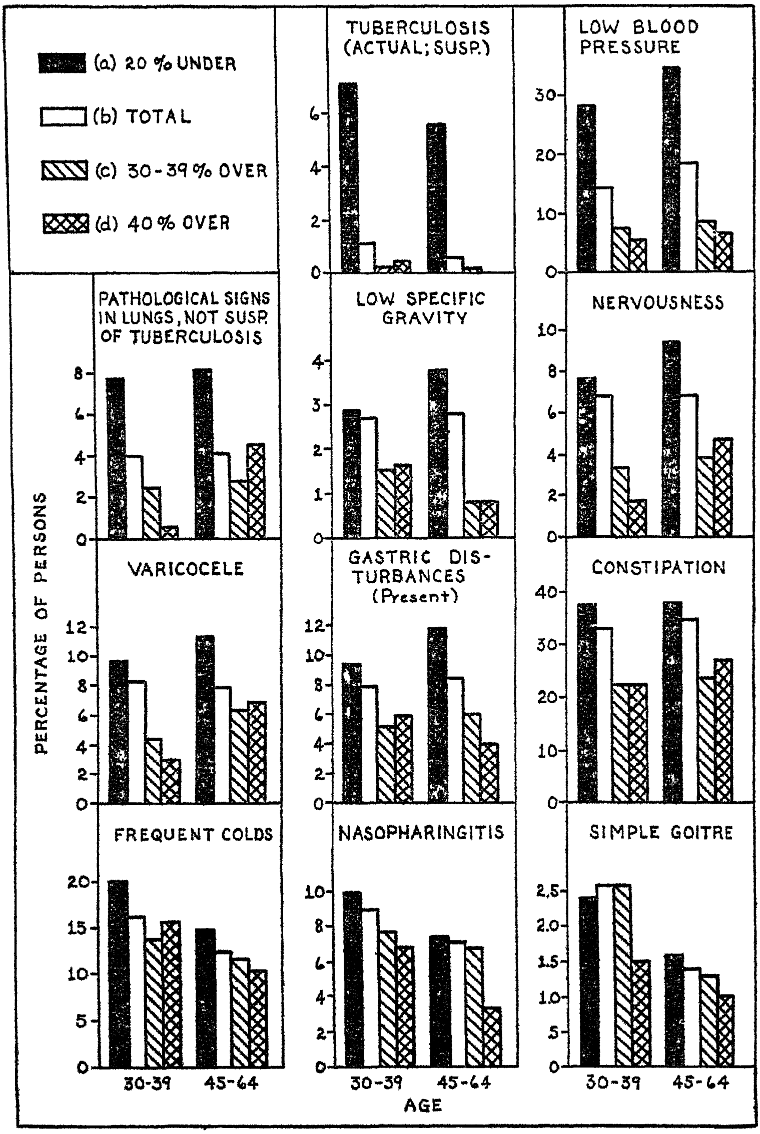

FIGURE 1.—Rate of physical impairment among persons markedly under or over standard weight. Decrease as weight increases.

with the mortality data previously discussed. However, two points should be kept in mind. In the first place, since (unlike the mortality data discussed above) weight and impairment were ascertained at the

same time, these examinations must have been made on many persons whose weight was reduced because they had a specific disease, possibly in an incipient form. Perhaps the recorded impairment amounted only to a vague symptom. That would tend to give an excess of impairments in the underweight class. In the second place, as will be clearer shortly, the major degenerative conditions which are responsible for the excess mortality among overweight people may be overlooked in a physical examination of apparently well people.

Before any conclusion is reached as to the meaning of the gross figures just given, it is necessary to consider the specific impairments. In tables 11 and 12 are given the rate of impairments for different weight classes, together with the ratio of the rate among persons 30 percent and more above the average weight, to that among persons 20 percent and more below the average. For brevity, only conditions are given for which the ratio seems to be significantly different from 100. Two age groups, 30 to 39 and 45 to 64, are used. Figures for the total number of persons examined have been included where available from previous reports in this series. These necessarily include persons in the underweight and overweight groups, but are affected by this factor to only a slight extent.

The first table presents those impairments showing an excess among underweight people. As stated above, physical defects which showed higher rates in this class because of easier palpation and auscultation are omitted from the table. Some of the outstanding relations are shown in figure 1.

TABLE 11.—*Rate of impairments and hygienic errors among men under and over standard weight for height and age, in age groups 30–39 and 45–64. "Field."*

[Rates which decrease as weight increases]

Impairment	Weight group [1]	Ratio [2]			Rate		Cases	
		Average	30–39	45–64	30–39	45–64	30–39	45–64
Tuberculosis, present (actual and suspected)	a				7.1	5.6	47	17
	b	4	6	3	1.2	.70	386	143
	c				.16	.13	1	1
	d				.37	---	1	0
History	a				1.1	1.0	7	5
	c				.33	.26	2	2
	d				---	---	0	0
Low blood pressure (15 mm and more below average for age)	a				28.3	34.9	188	105
	b	23	24	23	14.3	18.6	3,992	3,297
	c				7.5	8.7	46	68
	d				5.5	6.8	15	27
Pathological signs in lungs (not suspicious of tuberculosis)	a				7.8	8.2	52	25
	b	32	24	40	4.0	4.1	1,287	850
	c				2.5	2.8	15	22
	d				.74	4.3	2	17
Neurasthenia	a				3.2	3.6	21	11
	b	33	31	36	1.7	1.6	549	222
	c				1.0	1.1	6	9
	d				1.1	1.5	3	6
Low specific gravity of urine (less than 1.01)	a				2.9	3.8	18	11
	b	37	52	23	2.7	2.8	799	540
	c				1.4	.87	8	6
	d				1.6	.85	4	3

[1] Weight groups: (a) 20 percent or more under average weight for height and age; (b) total group; (c) 30 to 39 percent over average; (d) 40 percent and more over average.

[2] Ratio of the rate in the group 30 percent or more over to that in the group 20 percent or more under.

TABLE 11.—*Rate of impairments and hygienic errors among men under and over standard weight for height and age, in age groups 30–39 and 45–64. "Field."*—Continued

[Rates which decrease as weight increases]

Impairment	Weight group	Ratio: Average	Ratio: 30–39	Ratio: 45–64	Rate: 30–39	Rate: 45–64	Cases: 30–39	Cases: 45–64
Nervousness	a	41	38	44	7.7	8.8	51	27
	b				6.9	6.3	2,227	1,303
	c				3.4	3.7	21	29
	d				1.8	4.3	5	17
Varicocele	a	49	42	56	9.6	11.4	64	35
	b				8.2	7.8	2,649	1,593
	c				4.4	6.3	27	49
	d				3.0	6.8	8	27
Gastric disturbances (present)	a	49	56	42	9.6	11.8	64	36
	b				8.0	8.5	2,603	1,747
	c				5.2	6.0	32	47
	d				5.9	4.0	16	16
History (including ulcers)	a				1.2	3.3	8	10
	c				.82	1.4	5	11
	d				-------	.50	0	2
Deflected septum (marked degree)	a	54	60	48	4.2	5.2	28	16
	b				3.8	3.4	1,227	707
	c				2.9	2.6	18	20
	d				1.5	2.3	4	9
Constipation	a	61	60	63	37.4	38.2	249	117
	b				33.0	34.1	10,694	7,014
	c				22.4	22.6	137	177
	d				22.9	27.1	62	108
Too little water drunk (less than 6 glasses daily)	a	67	63	71	26.2	25.8	174	79
	c				18.3	19.4	112	152
	d				12.2	15.8	33	63
Vitamin deficiency	a	70	70	70	11.3	11.1	75	34
	c				6.7	6.5	41	51
	d				10.7	10.3	29	41
Frequent colds	a	73	71	76	20.2	14.7	134	45
	b				16.4	12.3	5,291	2,531
	c				13.4	11.5	82	90
	d				16.2	10.5	44	42
Nasopharyngitis	a	73	74	73	10.2	7.5	69	23
	b				8.8	7.0	2,838	1,447
	c				7.8	6.6	48	52
	d				6.6	3.3	18	13
Acid stomach	a	78	80	76	13.2	13.4	88	41
	b				11.2	11.2	3,618	2,293
	c				9.8	10.2	60	80
	d				12.2	10.3	33	41
Habitual use of laxatives	a	79	81	78	28.3	31.4	188	96
	b				25.9	28.3	8,375	5,826
	c				23.1	23.9	141	187
	d				22.9	25.3	62	101
Simple goiter	a	86	96	75	2.4	1.6	16	5
	b				2.6	1.4	856	290
	c				2.6	1.3	16	10
	d				1.5	1.0	4	4

COMMENTS ON DATA PRESENTED IN TABLE 11

1. The finding in the case of tuberculosis is consistent with the mortality data previously discussed. Although loss of weight because of the disease may have been responsible for part of the difference, it is reasonable to conclude that these figures give evidence of a higher susceptibility to tuberculosis among underweight persons.

2. The relationship between blood pressure and weight is well recognized and will be specially discussed later.

3. Some meaning is thrown upon the heading, "Pathological signs in lungs, not suspicious of tuberculosis", since the rates are far higher among underweight persons and lead us to believe that, possibly in

some cases, the condition should have been suspected as being tuberculosis.

4. Neurasthenia and nervousness are very much higher among underweight persons, which is consistent with general ideas on this subject. It is possible that these and other symptoms and findings shown in the table may be early signs of pulmonary tuberculosis.

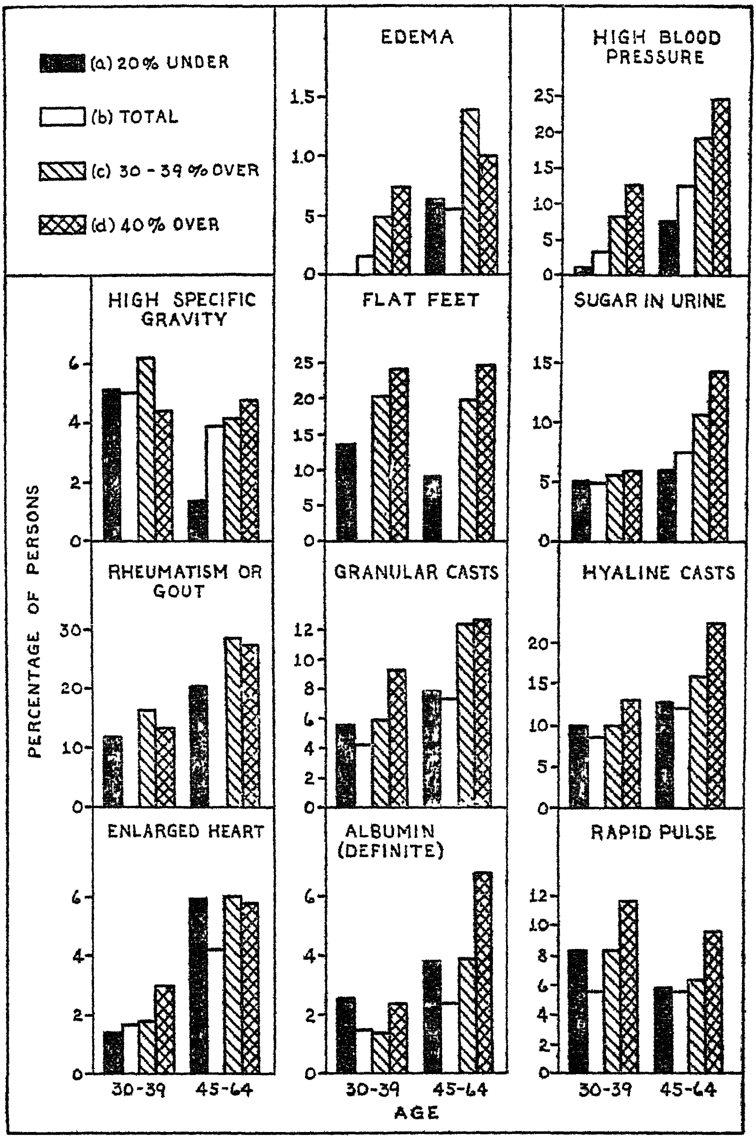

FIGURE 2.—Rate of physical impairment among persons markedly under or over standard weight. Increase as weight increases.

5. Gastric disturbances and constipation are consistently higher in underweight persons. Both are frequently associated with nervousness.

6. The differences for frequent colds and nasopharyngitis are suggestive.

7. The consistency of the results in the two age groups is very definite.

8. It is clear, however, that, although in some cases the higher rates among underweight persons is a real phenomenon, part of these results must be discounted because of the possibility that the impairment itself has affected the weight of the individual. There is, of course, no way of determining the extent of this effect. We do know, however, that the individuals were able to be about, and therefore few of them could have had the particular disease in any advanced stage. At the same time, certain chronic conditions might have existed (with a definite effect on the person's weight) and might have been classified under some vague description, such as "gastric disturbances" or "pathological signs in the lungs."

We turn now to those conditions which showed an excess rate among persons who were over the "standard" weight for height and age. Table 12 gives the data and corresponds in form to the table just presented. Figure 2 shows the relations in a few of the more important cases.

TABLE 12.—*Rate of impairments and hygienic errors among men under and over standard weight for height and age, in age groups 30–39 and 45–64. "Field"*

[Rates which increase as weight increases]

Impairment	Weight group[1]	Ratio[2]			Rate		Cases	
		Average	30–39	45–64	30–39	45–64	30–39	45–64
General dietary excess	a	--------	1,667	--------	0.15	--------	1	0
	c				2.6	2.7	16	21
	d				2.2	3.0	6	12
Oedema	a	--------	--------	200	0	.65	0	2
	b				.17	.55	55	114
	c				.49	1.4	3	11
	d				.74	1.0	2	4
High blood pressure (20 mm and more above average for age).	a	462	647	277	1.5	7.7	10	23
	b				3.4	12.5	962	2,044
	c				8.3	19.4	51	152
	d				12.9	24.8	35	98
High specific gravity (more than 1.030).	a	216	125	307	5.1	1.4	32	4
	b				5.0	3.9	1,466	744
	c				6.2	4.1	35	28
	d				4.4	4.8	17	17
Flat feet	a	200	158	243	13.7	8.8	91	27
	c				20.4	19.7	125	154
	d				24.3	24.8	66	99
Rapid eating	a	195	193	197	23.6	20.3	157	62
	c				44.5	40.2	272	315
	d				47.9	39.6	130	158

[1] Weight groups: (a) 20 percent or more under average weight for height and age; (b) total group; (c) 30 to 39 percent over average; (d) 40 percent and more over average.

[2] Ratio of the rate in the group 30 percent or more over to that in the group 20 percent and more under.

TABLE 12.—*Rate of impairments and hygienic errors among men under and over standard weight for height and age, in age groups 30–39 and 45–64. "Field"*—Continued

[Rates which increase as weight increases]

Impairment	Weight group	Ratio			Rate		Cases	
		Average	30–39	45–64	30–39	45–64	30–39	45–64
Alcohol:								
Temperate	a	185	215	135	6.6	8.8	44	27
	c				15.4	11.4	94	89
	d				11.8	12.8	32	51
Excessive	a				.60	.65	4	2
	c				1.3	.89	8	7
	d				1.1	1.0	3	4
Sugar in urine:								
Trace (less than 0.1 percent)	a	164	114	197	4.9	5.8	31	17
	b				4.8	6.7	1,414	1,272
	c				4.9	8.7	28	60
	d				6.1	11.3	15	40
Definite amount (0.1 percent or more).	a				.16	.34	1	1
	b				.23	.85	68	162
	c				.71	2.0	4	14
	d				-------	3.1	0	11
Miscellaneous dietary errors	a	149	142	156	26.3	20.9	175	64
	c				34.8	29.6	213	232
	d				42.8	38.9	116	155
Hernia:								
Present	a	143	162	124	2.3	8.5	15	26
	b				3.7	9.5	1,203	1,958
	c				3.1	10.3	19	81
	d				3.3	8.8	9	35
Operation	a				1.4	1.0	9	3
	c				2.5	2.3	15	18
	d				3.7	1.5	10	6
Rheumatism or gout (history)	a	133	130	137	11.9	20.6	79	63
	c				16.3	28.6	100	224
	d				13.7	27.6	37	110
Casts in urine:								
Granular	a	133	115	148	5.6	7.9	35	23
	b				4.2	7.4	1,235	1,400
	c				6.0	12.5	34	86
	d				9.3	12.7	23	45
Hyaline	a				9.9	13.0	62	38
	b				7.7	12.1	2,273	2,289
	c				9.9	16.5	56	114
	d				13.4	22.3	33	79
Enlarged or diseased tonsils	a	128	132	124	25.9	20.6	172	63
	b				29.2	20.6	9,433	4,237
	c				36.3	25.3	222	198
	d				29.9	25.8	81	103
Enlarged heart	a	128	157	100	1.4	5.9	9	18
	b				1.7	4.2	558	865
	c				1.8	6.0	11	47
	d				3.0	5.8	8	23
Varicose veins	a	127	91	163	3.5	5.9	23	18
	b				3.0	7.0	969	1,445
	c				3.3	9.1	20	71
	d				3.0	10.8	8	43
Rapid pulse (over 90 per minute)	a	120	113	127	8.4	5.9	56	18
	b				6.1	5.7	1,798	1,170
	c				8.5	6.4	52	50
	d				11.8	9.8	32	39
Albumin in urine:								
Slight	a	117	107	128	17.2	20.6	108	60
	b				12.6	17.5	3,714	3,324
	c				19.2	23.6	109	163
	d				20.2	32.1	50	114
Definite	a				2.6	3.8	16	11
	b				1.5	2.4	432	451
	c				1.4	3.9	8	27
	d				2.4	6.8	6	24

COMMENTS ON DATA PRESENTED IN TABLE 12

1. A number of dietary habits indicating overeating naturally appear in this table.

2. An immense difference is noticed in the case of high blood pressure (to be discussed later).

3. Sugar, casts, and albumin in and high specific gravity of the urine all show some excess in the overweight group, especially in the age group 45-64, where degenerative conditions are so important. Having in mind the fact that serious degenerative impairments are not always revealed by the simple "health examinations" which these persons received, one is not surprised that the differences are not more marked. They are probably the most important findings in the table. They suggest the early presence of conditions which in the end will cause a real excess mortality in the overweight classes.

4. Although these urinary findings seem to indicate such a relation, it is to be noticed that only one specific degenerative impairment appears in the list, viz, enlarged heart. Recorded organic valvular lesions actually were in excess for the underweight persons, but were eliminated from consideration because of the relatively greater ease and accuracy of diagnosis for thin chest walls.

5. Summarizing, we may say that it is primarily through the urinary findings that we are able to trace the consistency of these results with those obtained from life insurance mortality data.

In the opinion of the examiners, excess weight definitely placed the individuals on a lower plane of health, as indicated by the ratings [7] which they gave at the time of the examination. In table 13 the percentage distribution of men according to these ratings is given for the three weight classes.

TABLE 13.—*Percentage distribution of men according to examiner's "rating", by weight status, in two age groups*

Age group and weight status	Rating				Persons
	AB, B, BC	C	CD	D, DE, E	
30-39:					
a 20 percent or more under	39.7	53.6	4.4	2.5	643
c 30 to 39 percent over	22 1	65.9	8.7	3.4	589
d 40 percent or more over	7.0	35.5	23.9	33.6	259
45-64.					
a 20 percent or more under	36 5	53.6	6.5	3.4	203
c 30 to 39 percent over	14.0	64.7	14.5	6.8	747
d 40 percent or more over	3.5	29.4	25.1	42 0	378

[7] The ratings were made on the following basis, consideration being given to both number and degree of severity of the impairments found:

AA=Perfect (never found).
A=Excellent (seldom found).
AB=Very minor physical defects or hygienic errors.
B=Minor physical defects or errors.
BC=Several minor or one moderate defect requiring medical attention.
C=Moderate defects requiring medical correction or supervision.
CD=Between C and D.
D=Advanced physical defect requiring medical or surgical attention.
DE=Between D and E.
E=Very serious physical condition.

The percentages are very much more favorable for the persons in the 20 percent or more underweight group than in the two overweight groups. In a way this may be taken as reflecting the physician's knowledge of the expected relation between weight and health, but it undoubtedly means much more than that. One thing which is of interest is the sharp differentiation in the mind of the examiner between persons 30 to 39 percent overweight and those 40 percent and more overweight.

IV

Much data have been published in regard to the relation between blood pressure and weight. However, in view of the extensiveness of the present material, it appeared advisable to determine whether slight variations in weight status gave significant differences in blood-pressure readings.[8] For this purpose average systolic blood pressures were calculated for a portion of the data (previously referred to as "business"), using a finer grouping as to underweight and overweight than in the previous comparisons. The figures are given in table 14.

TABLE 14.—*Average [1] systolic blood pressure by age and weight status. "Business"*

Weight status	Pressure			Persons		
	Age 20-29	Age 40-49	Age 50+	Age 20-29	Age 40-49	Age 50+
10 percent or more under	120.0	122.0	131.2	1,802	1,078	650
9 percent under to 9 percent over	123.0	125.7	135.0	4,155	3,762	2,507
10 to 19 percent over	125.2	129.4	137.7	767	1,524	1,205
20 percent and more over	126.2	132.8	141.3	484	1,373	1,144

[1] See text footnote 8.

The table shows consistent changes in systolic blood pressure with slight differences in weight for height and age. With respect to the group 10 percent or more under the standard weight, it should be pointed out that only a small percentage of people in the group will be very much under the standard. This can be shown by reference to table 4, where for age group 20–29 only 3.2 percent were 20 percent or more under the standard. Thus actually the difference in weight in relation to height and age, in passing from the first line to the fourth, is not more than perhaps 50 to 60 pounds.

The extremes in blood pressure associated with greater differences in weight in relation to height and age are shown clearly in table 15, which (in order to be more explicit) gives the percentage distribution

[8] Blood pressure was coded in the form of deviations from an accepted standard similar to the method used in the case of under and overweight. The groups were rather broad, making it impossible to determine a true mean. However, a median could be obtained by determining the percentage in each blood-pressure group, cumulating these percentages at two points (15 millimeters below the average and 20 millimeters above the average), plotting these on probability paper, connecting the two points with a straight line, and reading off the median deviation at the point where this line crossed 50 percent. This was then added to or subtracted from the "standard" pressure from which the deviations were originally obtained.

of persons as to systolic blood pressure in the three weight classes which have been used in the earlier sections of the report.

TABLE 15.—*Percentage distribution of men as to their blood pressure in relation to average for age, according to weight status. (Age groups 30–39 and 45–64)*

Age group	Weight status	Blood pressure: Under average, 25 mm and more	Under average, 15–24 mm	14 mm under to 19 mm over	Over average, 20–39 mm	Over average, 45 mm and more	Total
		Percentage					
30–9	a	8.6	19.8	70.1	1.3	.2	100
	b	2.8	11.5	82.3	3.0	.4	100
	c	1.1	6.4	84.2	6.9	1.5	100
	d	.4	5.2	81.5	9.6	3.4	100
45–64	a	14.3	20.6	57.6	5.7	2.0	100
	b	5.5	13.1	70.0	8.1	3.4	100
	c	1.5	7.2	71.8	12.2	7.3	100
	d	.8	6.1	68.4	17.4	7.4	100
		Number					
30–9	a	57	131	464	9	1	662
	b	781	3,211	23,016	851	111	27,970
	c	7	39	515	42	9	612
	d	1	14	220	26	9	270
45–64	a	43	62	173	17	6	301
	b	973	2,324	12,420	1,440	604	17,761
	c	12	56	560	95	57	780
	d	3	24	270	69	29	395

The relations are so striking that figure 3 has been prepared to bring them out clearly. A direct connection can be traced between this correlation and the definitely excessive mortality rates among persons with high blood pressure. (See especially Studies in the Diseases of Adult Life, No. 8.)

V

Thus analysis of the rates of impairment in a group of 3,000 men markedly under and over the standard weight for their height ~~and age~~ has shown similar relations to those previously established in the case of mortality. On the underweight side, tuberculosis stands out most clearly; on the overweight side, degenerative conditions, especially as indicated by urinalysis findings and high blood pressure.

STUDIES IN THE DISEASES OF ADULT LIFE

(1) General Results of a Statistical Study of Medical Examinations by the Life Extension Institute of 100,924 White Male Life Insurance Policyholders since 1921; and

(2) Prevalence at different ages, based on medical examinations by the Life Extension Institute of 100,924 White Male Life Insurance Policyholders since 1921. By Edgar Sydenstricker and Rollo H. Britten. Am. Jour. Hyg., Vol. XI, no. 1 (January 1930).

(3) Some Recent Changes in the Mortality Among Adults. By Dorothy G. Wiehl. Jour. Prev. Med., vol. 4, no. 3 (May 1930).
(4) Physical Impairments and Occupational Class. Differential rates based upon medical examinations of 100,924 native-born, adult white insured males. By Edgar Sydenstricker and Rollo H. Britten. Pub. Health Rep., vol. 45, no. 34 (August 22, 1930).

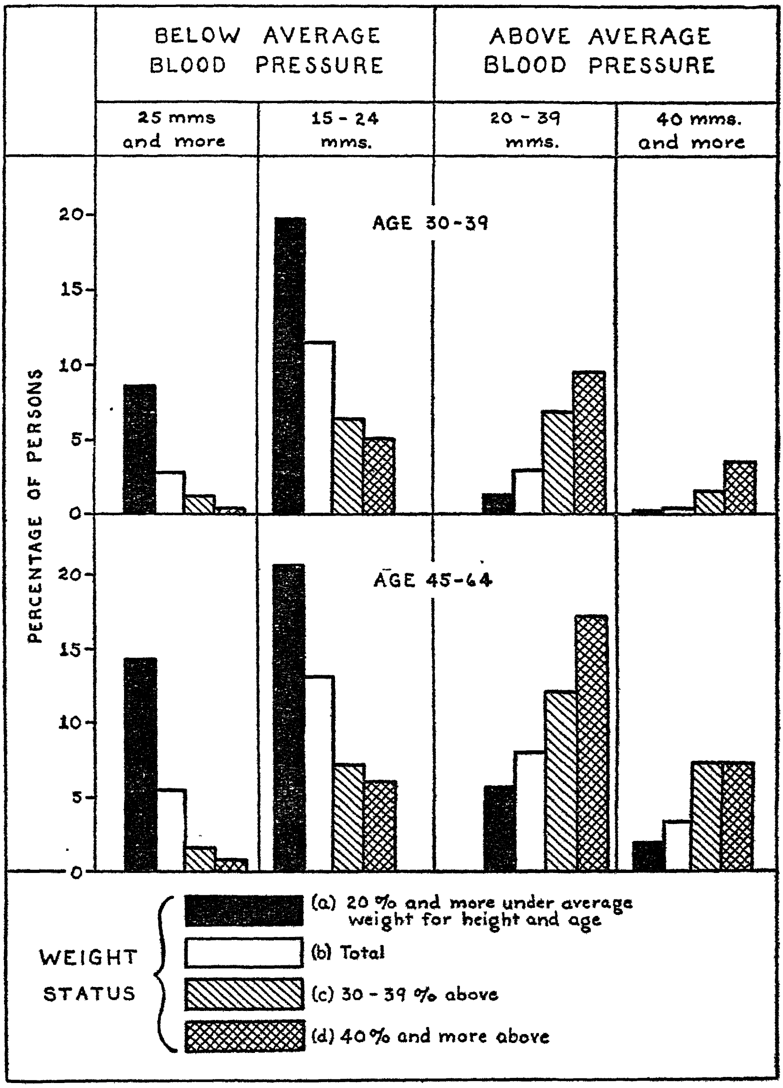

FIGURE 3.—Correlation of systolic blood pressure and weight status.

(5) The Incidence of Illness Among Wage-Earning Adults. By Dean K. Brundage. Jour. Ind. Hyg., Vol. XII, no. 9 (November, 1930).
(6) Rates of Physical Impairments in 28 Occupations Based on 17,294 Medical Examinations. By Rollo H. Britten and Jennie C. Goddard. Pub. Health Rep., vol. 47, no. 1 (January 1, 1932).

(7) Sex Differences in the Physical Impairments of Adult Life. A comparison of rates among men and women, based on 112,618 medical examinations by the Life Extension Institute. By Rollo H. Britten. Am. Jour. Hyg., Vol. XIII, no. 3 (May, 1931).
(8) A New Measure of the People's Health. A critical summary of medical examination records. By Rollo H. Britten and Jennie C. Goddard. Milbank Memorial Fund Quarterly Bulletin, Vol. X, no. 3 (July, 1932).
(9) The Physical Impairments of Adult Life: Association with subsequent rates of mortality. By Rollo H. Britten. Jour. Prev. Med., vol. 6, no. 4 (July 1932).

COURT DECISION RELATING TO PUBLIC HEALTH

Compensation for death from Rocky Mountain spotted fever granted under workmen's compensation act.—(Idaho Supreme Court; *Roe* v. *Boise Grocery Co. et al.*, 21 P. (2d) 910; decided Apr. 24, 1933.) In this case, the supreme court affirmed an award under the workmen's compensation act to a widow for the death of her husband from Rocky Mountain spotted fever. The court took the view that the evidence was sufficient to justify the conclusion that the deceased, a traveling salesman, was bitten by a wood tick while engaged in the performance of his duties.

In the prior case of *Reinoehl* v. *Hamacher Pole and Lumber Co. et al.*,[1] 6 P. (2d) 860, decided by the Idaho Supreme Court on December 8, 1931, it had been held that a swamper for a lumber company, who had died from Rocky Mountain spotted fever contracted through tick bites, had received "a personal injury by accident arising out of and in the course of his employment."

DEATHS DURING WEEK ENDED JULY 15, 1933

[From the Weekly Health Index issued by the Bureau of the Census, Department of Commerce]

	Week ended July 15, 1933	Corresponding week, 1932
Data from 85 large cities of the United States:		
Total deaths	6,849	7,060
Deaths per 1,000 population, annual basis	9.6	10.1
Death under 1 year of age	552	576
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	46	47
Deaths per 1,000 population, annual basis, first 28 weeks of year	11.4	11.8
Data from industrial insurance companies:		
Policies in force	67,765,248	71,961,997
Number of death claims	12,824	13,183
Death claims per 1,000 policies in force, annual rate	9.9	9.6
Death claims per 1,000 policies, first 28 weeks of year, annual rate	10.3	10.1

[1] *See* Public Health Reports, vol. 47, No. 13, Mar. 25, 1932, p. 728.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS,

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended July 22, 1933, and July 23, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 22, 1933, and July 23, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932
New England States:								
Maine	1	3				109	0	0
New Hampshire					7	21	0	0
Vermont	1				7	66	0	0
Massachusetts	12	29		2	191	260	3	1
Rhode Island	7	2				12	0	0
Connecticut	7	1	1	6	40	75	1	2
Middle Atlantic States:								
New York	26	48	[1] 1	[1] 1	367	695	3	1
New Jersey	17	19	1	2	153	233	0	1
Pennsylvania	29	38			261	232	3	8
East North Central States:								
Ohio [2]	14	13	6	2	41	91	1	5
Indiana	13	9	10	14	24	5	1	7
Illinois [2]	10	26	12	2	89	91	0	2
Michigan	29	17			64	426	0	1
Wisconsin	4	8	5	8	55	176	0	0
West North Central States:								
Minnesota	8	4	1	1	33	15	1	0
Iowa [4]	5	6			6	2	1	2
Missouri	22	20			15	15	1	2
North Dakota	4	4			16	4	0	0
South Dakota	1	1				2	0	0
Nebraska	4	2			12		0	0
Kansas	4	10	2	1	7	33	1	0
South Atlantic States:								
Delware	1				1		0	0
Maryland [2 3 4]	4	4	2		9	5	0	1
District of Columbia		5	1	1	12	4	1	0
Virginia	11	9			37	40	1	1
West Virginia	9	19	2		3	240	0	0
North Carolina [3 4]	14	14	1	43	82	299	3	1
South Carolina	11	10	79	67	101	7	0	0
Georgia [2]	9	6		21	33	6	1	0
Florida [2]	6	9		1	46	1	0	0
East South Central States:								
Kentucky	3				9		1	1
Tennessee	9	5	11	7	47	2	1	1
Alabama [3]	12	12	2	7	26		2	0
Mississippi [3]	9	15					0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 22, 1933, and July 23, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932
West South Central States								
Arkansas	6		1		59	1	0	0
Louisiana	13	9	8	2	5		1	1
Oklahoma [5]	4	7			10	4	1	1
Texas [2]	42	34	62	27	113	9	0	0
Mountain States:								
Montana [4]		1			2	7	0	0
Idaho	1		4			1	1	0
Wyoming [4]					1	2	0	0
Colorado		14			13	12	0	0
New Mexico	3	6	1		9		0	0
Arizona	2				16		0	0
Utah [3 4]					24	5	0	0
Pacific States:								
Washington	4	6			27	30	0	0
Oregon	1		17	6	62	14	0	0
California	31	54	12	17	177	65	2	2
Total	423	499	242	238	2,312	3,317	31	41

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932
New England States:								
Maine	0	0	18	10	0	0	2	3
New Hampshire	0	0	8	5	0	0	1	1
Vermont	0	0		14	0	0	0	0
Massachusetts	19	5	108	115	0	0	9	5
Rhode Island	0	0	4	11	0	0	2	1
Connecticut	2	2	25	16	0	0	2	2
Middle Atlantic States:								
New York	27	4	118	196	0	12	43	27
New Jersey	1	2	48	31	0	0	11	1
Pennsylvania	5	5	126	141	0	0	16	45
East North Central States:								
Ohio [2]	6	0	106	57	1	8	26	32
Indiana	0	1	19	16	0	3	24	34
Illinois [2]	7	6	98	60	2	1	30	42
Michigan	0	3	58	110	0	0	4	10
Wisconsin	0	2	25	21	6	0	4	0
West North Central States:								
Minnesota	10	3	17	17	0	0	0	1
Iowa [4]	0	0	8	6	0	9	1	4
Missouri	0	1	15	34	1	2	16	58
North Dakota	1	0	1		0	1	0	1
South Dakota	2	0	3	5	0	0	1	2
Nebraska	0	0	14		1	0	3	2
Kansas	1	0	14	11	0	6	15	20
South Atlantic States:								
Delaware	0	0		5	0	0	2	0
Maryland [2 3 4]	0	1	32	11	0	0	22	23
District of Columbia	0	0	2	3	0	0	0	4
Virginia	1	1	26	15	1	1	59	64
West Virginia	12	1	7	4	0	0	33	39
North Carolina [2 4]	1	0	23	19	0	3	40	61
South Carolina	0	1	5	1	0	0	52	71
Georgia [2]	0	0	5	5	0	0	37	86
Florida [2]	0	0	1	2	0	0	2	7
East South Central States:								
Kentucky	1	1	12	14	1	0	68	192
Tennessee	9	0	8	7	0	1	92	128
Alabama [2]	1	1	15	12	0	1	26	47
Mississippi [3]	0	0	4	1	0	1	16	37

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 22, 1933, and July 23, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932
West South Central States:								
Arkansas	1	0	1	1	1	1	25	51
Louisiana	1	0	5	5	0	0	39	74
Oklahoma [5]	0	0	1	9	0	15	36	62
Texas [2]	1	4	27	13	6	5	61	39
Mountain States:								
Montana [4]	1	0		13	0	6	4	4
Idaho	0	0		1	2	2	0	0
Wyoming [4]	0	0	5	3	0	0	0	0
Colorado	0	0	10	14	0	3	4	5
New Mexico	0	0	1	2	0	0	9	3
Arizona	0	0	3	3	0	0	4	2
Utah [3] [4]	0	0	6	3	0	0	1	0
Pacific States:								
Washington	1	0	11	10	7	11	4	1
Oregon	0	1	5	3	8	2	2	5
California	5	4	67	44	2	9	8	15
Total	116	49	1,115	1,099	39	103	856	1,311

[1] New York City only.
[2] Typhus fever, week ended July 22, 1933, 97 cases, as follows: Ohio, 9; Illinois, 1; Maryland, 1; North Carolina, 1; Georgia, 25; Florida, 1; Alabama, 39; Texas, 20.
[3] Week ended Friday.
[4] Rocky Mountain spotted fever, week ended July 22, 1933, 17 cases, as follows: Iowa, 2; Maryland, 5; Virginia, 2; North Carolina, 2; Montana, 2; Wyoming, 3; Utah, 1.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
June 1933										
Delaware		2	2		55		0	17	0	0
Florida		15	6	27	59	16	0	6	1	14
Illinois	29	87	68	8	1,857	2	8	933	14	60
Indiana	10	52	81		587		3	214	8	63
Louisiana	3	33	44	68	82	48	2	28		107
Maryland		28	8	1	141	2	1	211	0	40
Minnesota	6	47	5		749		7	180	4	5
New Hampshire		1					0	170	0	1
New Mexico	1	25	1	2	58	1	0	23	1	5
New York	13	202		2	6,385		13	1,646	0	60
Pennsylvania	11	194		1	4,330		6	1,645	0	89
Rhode Island		12	1		13		0	76	0	1
South Carolina		126	382	889	823	327	1	12		115
South Dakota	1	7			43		1	27	0	8
West Virginia	5	13	3		262	4	3	59	7	37

June 1933

	Cases
Anthrax:	
New York	1
Pennsylvania	1
Chicken pox:	
Delaware	9
Florida	11
Illinois	960
Indiana	192
Louisiana	3
Maryland	282

Chicken pox—Continued.	Cases
Minnesota	400
New Mexico	9
New York	2,302
Pennsylvania	2,610
Rhode Island	113
South Carolina	89
South Dakota	64
West Virginia	93
Conjunctivitis:	
New Mexico	1

Dengue:	Cases
South Carolina	3
Diarrhea:	
South Carolina	1,771
Dysentery:	
Florida	3
Illinois (amebic)	3
Illinois (bacillary)	10
Louisiana	2
Maryland	16
Minnesota (amebic)	1

Disease and State	Cases
Dysentery—Continued.	
New Mexico	1
New York	4
West Virginia	25
German measles:	
Illinois	67
Maryland	6
New Mexico	1
New York	103
Pennsylvania	65
Rhode Island	1
Hookworm disease:	
Louisiana	27
South Carolina	123
Impetigo contagiosa:	
Illinois	2
Maryland	9
Lead poisoning:	
Illinois	2
Leprosy:	
Illinois	1
Louisiana	1
West Virginia	1
Lethargic encephalitis:	
Illinois	5
Louisiana	2
Minnesota	2
New York	8
Pennsylvania	4
South Carolina	2
Mumps:	
Delaware	3
Florida	18
Illinois	627
Indiana	96
Louisiana	3
Maryland	289
New Mexico	29
Pennsylvania	825
Rhode Island	19
South Carolina	38
South Dakota	3
Ophthalmia neonatorum:	
Illinois	11
Maryland	2
Ophthalmia neonatorum—Continued.	
Minnesota	1
New York	8
Pennsylvania	6
South Carolina	10
Paratyphoid fever:	
Illinois	1
Indiana	6
Louisiana	3
New York	8
South Carolina	7
Puerperal septicemia:	
Illinois	7
Pennsylvania	10
Rabies in animals:	
Illinois	25
Indiana	36
Louisiana	10
New York [1]	1
South Carolina	14
Rocky Mountain spotted fever:	
Indiana	1
Maryland	21
New York	1
Septic sore throat:	
Illinois	26
New York	18
West Virginia	67
Tetanus:	
Illinois	8
Louisiana	4
Maryland	1
New York	9
Pennsylvania	5
South Carolina	2
Trachoma:	
Illinois	3
Pennsylvania	1
Rhode Island	1
Trichinosis:	
New York	1
Tularaemia:	
Louisiana	4
Tularaemia—Continued.	
Minnesota	10
New Mexico	1
South Carolina	1
Typhus fever:	
Delaware	1
Florida	3
Illinois	1
Louisiana	2
Maryland	6
New York	2
South Carolina	9
West Virginia	1
Undulant fever:	
Illinois	6
Indiana	1
Louisiana	1
Maryland	8
Minnesota	5
New Mexico	2
New York	29
Pennsylvania	3
South Carolina	2
South Dakota	1
Vincent's angina:	
Illinois	45
Maryland	14
New York [1]	64
Whooping cough:	
Delaware	19
Florida	71
Illinois	729
Indiana	325
Louisiana	61
Maryland	320
Minnesota	700
New Mexico	55
New York	1,779
Pennsylvania	993
Rhode Island	146
South Carolina	591
South Dakota	41
West Virginia	110

[1] Exclusive of New York City.

WEEKLY REPORTS FROM CITIES

City reports for week ended July 15, 1933

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Maine:											
Portland	0		0	1	0	0	0	0	2	2	17
New Hampshire:											
Concord	0		0	0	0	2	0	0	0	0	10
Nashua	0		0	0	0	0	0	0	0	0	0
Vermont:											
Barre	0		0	7	0	0	0	0	0	3	1
Burlington	0		0	0	0	2	0	0	1	0	13
Massachusetts:											
Boston	2		1	83	10	18	0	9	0	52	187
Fall River	1		1	2	0	3	0	1	0	7	19
Springfield	0		0	2	0	1	0	1	0	9	25
Worcester	0		0	40	1	3	0	2	0	0	
Rhode Island:											
Pawtucket	1		0	0	0	0	0	0	0	0	8
Providence	1		0	0	2	2	0	0	1	35	41
Connecticut:											
Bridgeport	0	1	0	4	1	3	0	0	0	2	27
Hartford	0		0	1	1	1	0	0	0	0	31
New Haven	1		0	0	1	0	0	0	1	13	32
New York:											
Buffalo	7		0	45	9	10	0	9	0	37	99
New York	46	3	3	127	88	37	0	75	17	100	1,262
Rochester	0		0	0	1	7	0	0	2	21	66
Syracuse	0		0	0	2	4	0	2	0	10	31

City reports for week ended July 15, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
New Jersey:											
Camden	1	-------	0	3	0	3	0	0	1	0	22
Newark	2	-------	0	6	2	5	0	4	1	39	74
Trenton	0	-------	0	11	1	4	0	3	0	6	30
Pennsylvania:											
Philadelphia	3	1	1	132	10	39	0	26	1	14	376
Pittsburgh	6	2	2	4	11	26	0	10	2	119	116
Reading	0	-------	0	1	2	1	0	2	0	14	29
Ohio:											
Cincinnati	1	-------	0	7	3	4	0	10	1	17	117
Cleveland	3	11	0	1	6	17	0	15	6	55	163
Columbus	0	1	1	1	2	12	0	3	0	0	80
Toledo	1	-------	0	19	0	20	0	2	1	17	44
Indiana:											
Fort Wayne	2	-------	0	0	0	0	0	0	0	0	16
Indianapolis	0	-------	1	9	5	2	0	5	0	30	-------
South Bend	0	-------	0	2	2	0	0	1	0	0	18
Terre Haute	0	-------	0	0	1	2	0	1	1	3	13
Illinois:											
Chicago	1	-------	3	61	24	82	0	43	3	64	595
Springfield	0	2	0	1	0	0	0	0	3	0	26
Michigan:											
Detroit	20	2	0	22	6	23	0	24	2	133	210
Flint	1	-------	0	0	1	4	0	3	0	20	22
Grand Rapids	0	-------	0	1	0	2	0	0	0	7	24
Wisconsin:											
Kenosha	0	-------	0	1	0	0	0	0	0	29	3
Madison	1	-------	-------	0	-------	0	0	-------	0	14	-------
Milwaukee	0	1	1	2	3	5	0	4	0	111	73
Racine	0	-------	0	0	0	1	0	0	1	34	10
Superior	0	-------	0	0	0	0	0	0	0	18	7
Minnesota:											
Duluth	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Minneapolis	2	-------	0	1	2	2	0	3	0	5	89
St. Paul	0	-------	0	5	2	13	0	0	0	63	44
Iowa:											
Des Moines	0	-------	-------	0	-------	4	0	-------	0	0	-------
Sioux City	2	-------	-------	0	-------	0	0	-------	0	2	-------
Waterloo	0	-------	-------	0	-------	0	0	-------	0	0	-------
Missouri:											
Kansas City	4	-------	0	1	8	1	0	4	0	4	92
St. Joseph	0	-------	0	1	5	1	0	3	0	2	34
St. Louis	10	-------	-------	48	2	2	0	7	5	14	158
North Dakota:											
Fargo	0	-------	0	0	0	0	0	0	0	1	-------
Grand Forks	0	-------	0	1	0	0	0	0	0	0	-------
South Dakota:											
Aberdeen	0	-------	0	0	0	0	0	0	0	0	-------
Nebraska:											
Omaha	2	-------	0	7	1	2	0	1	0	8	54
Kansas:											
Topeka	0	-------	0	0	1	0	0	1	0	3	20
Wichita	0	-------	0	0	2	1	0	1	1	11	23
Delaware:											
Wilmington	0	-------	0	1	1	2	0	2	1	5	26
Maryland:											
Baltimore	4	1	0	2	9	12	0	7	0	54	179
Cumberland	0	-------	0	0	0	0	0	1	0	0	6
Frederick	0	-------	0	0	0	0	0	0	0	0	4
District of Col.:											
Washington	6	-------	0	22	7	6	0	11	0	15	125
Virginia:											
Lynchburg	0	-------	0	11	0	2	0	0	0	23	9
Norfolk	0	-------	0	0	2	1	0	1	3	3	27
Richmond	0	-------	1	0	2	2	0	3	1	13	44
Roanoke	0	-------	0	0	0	0	0	2	0	0	15
West Virginia:											
Charleston	0	-------	0	0	1	0	0	1	0	2	14
Huntington	0	-------	0	0	0	0	0	0	0	0	0
Wheeling	0	-------	0	0	0	0	0	0	0	15	17
North Carolina:											
Raleigh	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Wilmington	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Winston-Salem	0	-------	0	1	0	0	0	1	0	1	14

City reports for week ended July 15, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
South Carolina:											
Charleston	0	3	0	0	1	0	0	3	1	3	21
Columbia	0		0	0	2	0	0	0	0	0	18
Greenville	0		0	0	0	0	0	0	1	0	7
Georgia:											
Atlanta	5	5	1	5	0	1	0	3	2	14	54
Brunswick	0		0	0	0	1	0	0	0	0	1
Savannah	0	3	0	10	1	0	0	0	0	0	27
Florida:											
Miami	0		0	0	0	0	0	1	0	2	19
St. Petersburg											
Tampa	0		0	0	1	0	0	1	0	0	19
Kentucky:											
Ashland	0		0	0	0	0	0	0	0	0	0
Lexington	0		0	0	1	0	0	2	0	0	14
Louisville	1		0	2	4	3	0	1	1	2	53
Tennessee:											
Memphis	1		1	22	2	0	0	4	5	18	85
Nashville	0		0	3	0	1	0	1	0	20	49
Alabama:											
Birmingham	1	5	1	0	1	0	0	5	6	2	74
Mobile	0		0	11	1	0	0	0	0	0	19
Montgomery	0			0		0	0		0	0	
Arkansas:											
Fort Smith	0			0		0	0		0	6	
Little Rock	0		0	1	1	0	0	1	1	0	2
Louisiana:											
New Orleans	2	3	0	3	8	3	0	11	1	0	130
Shreveport	0		0	0	3	0	0	0	0	0	
Oklahoma:											
Tulsa	0			4		0	0		0	12	
Texas:											
Dallas	0		0	0	1	3	0	2	1	3	72
Fort Worth	0		0	0	4	1	0	3	0	0	32
Galveston	0		0	0	1	0	0	0	1	0	16
Houston	5		0	0	2	1	0	4	0	1	67
San Antonio	0		0	0	5	0	1	7	0	2	59
Montana:											
Billings	0		0	0	0	0	0	0	0	0	4
Great Falls	0		0	1	0	0	0	0	0	3	4
Helena	0		0	0	0	0	0	0	0	0	1
Missoula	0		0	0	0	0	0	0	0	0	4
Idaho:											
Boise:											
Colorado:											
Denver	1	16	0	1	5	7	0	6	0	7	55
Pueblo	0		0	0	0	1	0	0	0	2	5
New Mexico:											
Albuquerque	0		0	0	0	0	0	1	0	6	6
Utah:											
Salt Lake City	0		2	21	1	4	0	1	0	21	26
Nevada:											
Reno	0		0	0	0	0	0	0	0	0	2
Washington:											
Seattle	0			2		4	0		1	22	
Spokane	0			50		1	0		0	0	
Tacoma	0		0	0	4	2	1	0	0	0	17
Oregon:											
Portland	1		0	3	4	6	3	0	0	3	54
Salem	0		0	1	0	0	0	0	0	0	
California:											
Los Angeles	15	14	0	72	11	21	9	22	1	78	290
Sacramento	0		0	0	1	0	0	1	0	11	23
San Francisco	0		0	6	4	1	0	7	0	14	133

City reports for week ended July 15, 1933—Continued

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Missouri:			
Boston	2	2	17	Kansas City	1	0	0
Worcester	0	0	2	St. Joseph	1	0	0
Connecticut:				Maryland:			
Bridgeport	1	1	1	Baltimore	0	0	3
New York:				District of Columbia:			
New York	3	0	10	Washington	0	0	1
New Jersey:				West Virginia:			
Newark	0	0	1	Wheeling	0	0	1
Pennsylvania:				Tennessee:			
Pittsburgh	1	1	1	Memphis	0	0	1
Ohio:				Texas:			
Toledo	0	0	1	Dallas	1	1	0
Indiana:				Colorado:			
Indianapolis	4	0	0	Denver	0	0	1
Illinois:				California:			
Chicago	4	3	1	San Francisco	1	1	0
Wisconsin:							
Milwaukee	1	0	0				

Lethargic encephalitis.—Cases: New York, 1; Minneapolis, 1.

Pellagra.—Cases: Baltimore, 1; Winston-Salem, 1; Miami, 1; Tampa, 1; Birmingham, 3; Montgomery, 1; New Orleans, 1; Dallas, 1; San Francisco, 1.

Rabies (in man).—Nashville, 1 death.

Typhus fever.—Cases: Atlanta, 2; Savannah, 2; Tampa, 2.

FOREIGN AND INSULAR

CUBA

Habana—Communicable diseases—Four weeks ended July 15, 1933.—During the 4 weeks ended July 15, 1933, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	8	5	Scarlet fever	1	
Leprosy	2		Tuberculosis	17	3
Malaria	9		Typhoid fever	9	6

Provinces—Communicable diseases—Four weeks ended June 24, 1933.—During the 4 weeks ended June 24, 1933, cases of certain communicable diseases were reported in the provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Chicken pox			4			10	14
Diphtheria		1	1			1	3
Malaria		24	6	1	12	5	48
Measles			2			14	16
Scarlet fever			1				1
Tuberculosis	1	75	38	88	64	44	310
Typhoid fever	6	15	5	8	8	19	61

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for July 28, 1933, pp. 896–906. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued August 25, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

China.—During the week ended July 15, 1933, 1 case of cholera with 1 death was reported in Canton, China.

Philippine Islands.—During the week ended July 22, 1933, cholera was reported in the Philippine Islands as follows: Province of Cebu, Opon, 37 cases, 16 deaths; Santa Fe, 1 case, 2 deaths; Toledo, 3 cases, 2 deaths.

Plague

Ceylon.—During the week ended July 8, 1933, 1 case of plague with 1 death was reported in Colombo. During the week ended July 1,

1933, 1 case of plague with 1 death and 2 plague-infected rats were reported in the same place.

Egypt.—During the week ended July 8, 1933, 1 case of plague with 1 death was reported in the Province of Girga.

Iraq.—During the week ended July 1, 1933, 3 cases of plague were reported in Baghdad.

Typhus Fever

Algeria.—During the week ended July 1, 1933, 18 cases of typhus fever were reported in Constantine Department.

Egypt.—During the week ended July 15, 1933, 3 cases of typhus fever with 3 deaths were reported in Alexandria. During the week ended July 8, 1933, 1 case of typhus fever with 1 death was reported in Cairo and 1 case in Port Said.

×

UNITED STATES TREASURY DEPARTMENT

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Deaths in Large Cities During the Week Ended July 22
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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ZINC IN RELATION TO GENERAL AND INDUSTRIAL HYGIENE

By Cecil K. Drinker, M.D., and Lawrence T. Fairhall, Ph.D., *Department of Physiology, Harvard School of Public Health, Boston, Mass.*

Recent investigations have greatly simplified and defined the problems arising from the ingestion and inhalation of zinc and zinc compounds. It is now known that zinc is not a poison in the usual sense of the word. That is to say, pure zinc, in contrast to metals such as arsenic, lead, antimony, and cadmium, has no poisonous qualities even if taken in large amounts. Certain zinc compounds, such as zinc chloride, are highly irritating and caustic; but this action is the common property of an infinite number of chemical substances. Certain other zinc compounds, such as zinc oxide or zinc stearate, on account of their fine state of division or their tendency to flocculation, may do harm, but not on account of their zinc content. Such effects are understandable and avoidable, a far different situation from that which would exist were the zinc ion poisonous in itself, so that after absorption one might count upon a series of unfortunate effects ending with elimination, with safe storage, or with the death of the subject.

This point of view is not in accord with the reputation zinc has held, a reputation which has arisen from the fact that zinc in the majority of instances occurs in ores with such substances as lead, arsenic, antimony, and cadmium, all definitely poisonous. Thus the older literature of general and industrial hygiene contains frequent descriptions of what are listed as cases of acute or chronic zinc poisoning, in which the symptoms are attributable to contaminating metals (1).

In the light of present knowledge it is worth while to redefine the hygienic position of zinc. This may be done from two aspects—first, that of the relation of zinc and zinc compounds to the health of the general public, and, second, the relation of zinc and zinc compounds to the health of workers engaged in the manufacture of such compounds.

1. ZINC IN RELATION TO THE HEALTH OF THE PUBLIC

(*a*) *Zinc and zinc compounds in drinking water.*—The most important feature of this relation is the presence of zinc and zinc compounds in drinking water. The process of galvanizing is over a hundred years old; the making of brass pipe and brass containers is far older. In both cases solution of zinc may occur. In 1925, a

publication of the Public Health Service (Reprint no. 1029) placed a limit of 5 parts per million of zinc in drinking water. This limit is almost certain to be exceeded if water containing appreciable amounts of carbon dioxide remains in contact with brass (2) (3), if rainwater passes through galvanized pipe or is held in galvanized containers (4), and if the water is from springs in regions rich in zinc (5). In 14 groups of analyses made in various parts of the world, only 5 conform to the limit of 5 parts of zinc per million of water, and conformity is not invariable in water taken from the same systems of piping. The limit is often markedly exceeded. Thus Haines (6) found 56 parts of zinc per million of water drawn through galvanized iron pipe and Mason (5) 327 parts of zinc sulphate per million of spring water from the zinc-blende district of Missouri. Where such high figures have been obtained, the authors have frequently called attention to the possible hazard to health offered by the situation; but it is significant that during the many years in which zinc-lined pipe has been in use no definite cases of acute or chronic illness have ever been traced with certainty to zinc.

In a recent paper on "Zinc in Water Supplies", Bartow and Weigle (7) report upon 13 specimens of water from the zinc-producing area of Missouri, Kansas, and Oklahoma. They found 0.9 to 50 parts per million of zinc. Two sets of analyses were done, the first in April 1931, the second in May. The limit of 5 parts per million was reached in 3 specimens and doubled or much more than doubled in 12 specimens out of 21 examined. The authors made inquiries through the district and report: "From the best evidence obtainable, the water containing zinc was used by man and animals without harmful results." In order to gain further assurance, tests were made upon rats given water containing pure zinc sulphate. When the zinc so administered was as high as 100 parts per million, no appreciable ill effects were noted. Bartow and Weigle conclude:

> In reporting the harmful effects of zinc in water supplies in contact with galvanized pipes or containers, the possible effect of other impurities has not been considered—for example, cadmium and arsenic, which are sometimes present in zinc used for galvanizing.
>
> The indications that pure zinc salts in reasonable amounts in drinking water are not harmful, and the facts that pure zinc can now be made cheaply and that pure zinc is difficultly soluble, suggest the possibility that the solvent action of waters on galvanized iron pipes could be reduced by galvanizing them with pure zinc.

In connection with the large amounts of zinc sulphate used in these experiments and reported in drinking waters, we asked 10 women and 10 men to taste distilled water to which zinc sulphate had been added. Two detected 19 parts per million, 4 tasted 37 parts per million, 10 tasted 73 parts per million, and the remaining 4 made their first detection at 156 parts per million. All of the readily soluble

zinc salts possess an unpleasant, astringent taste. When added to water and this addition is wholly undisguised, most people are apparently able to detect the taste before there is possibility of taking in enough to produce gastric irritation. When, however, these salts contaminate food, their taste is easily disguised, and amounts irritating enough to cause vomiting can readily be ingested. So far as plain water is concerned it is certainly proper to conclude that a limit of zinc contamination of 5 parts per million is neither feasible nor necessary. Amounts greater than this are readily found and have not caused harm. If a limit is desirable, 30 parts per million is suggested for the following reason:

When the source of zinc contaminating water is galvanized pipe—and this is the most common situation with which we deal—the zinc compounds in the water will be a mixture of oxide, hydroxide, and carbonate, the latter predominating. If present to an amount of 30 mg of zinc per liter, or 30 parts per million, zinc carbonate will cause appreciable milkiness in the water, and many persons will complain of an astringent taste. While there is no reason to consider this harmful, it is doubtful whether any community would tolerate it without incessant complaint. Both taste and appearance act to prevent zinc in its most common form from being a persistent contaminant of water supplies even in amounts which are harmless.

It may be asked whether chlorinated water constitutes a special case. On the basis of extensive data upon the water supply of the Franklin Plant of the New Jersey Zinc Co., Anderson, Reinhard, and Hammel (8) conclude that chlorination reduces the attack of water upon zinc and is thus advantageous rather than the reverse. This conclusion is in accord with previous findings by Lothian and Ward (9).

(*b*) *Zinc and zinc compounds in foods.*—Zinc in varying amounts occurs universally in all types of plant and animal life. This fact has made it extremely difficult to perform experiments in which zinc has been eliminated from the diet, since foods freed from zinc are either so mutilated in the process as to be wholly unpalatable or have so far lost other necessary dietary constituents as to make feeding experiments impossible. The possibilities of zinc ingestion are well illustrated by the following high zinc meal taken for experimental purposes and reported by K. R. Drinker, Fehnel, and Marsh (10). The menu was as follows:

"Hors d'œuvres: yeast cake with anchovies, chopped olives, and mayonnaise; each subject ate approximately three-fourths of a yeast cake. Large raw oysters, twelve apiece. Oyster soup containing approximately eight oysters apiece. Duck, bread stuffing, apple sauce, wheat bran pudding, one large ear of corn on the cob each, butter (subject 1, bread). Strawberry gelatin, whipped cream. Coffee and sugar.

"The food materials in this meal especially rich in zinc were: Yeast (414.8 mg zinc per kilo), oysters (26 to 2,298 mg per kilo), bran (139.2 mg per kilo), corn (25.2 mg per kilo), gelatin (27.4 mg per kilo). These figures are taken from Lutz's (11) review of the normal occurrence of zinc in biological materials. An approximate estimate indicates that each subject ingested at this one meal between 225 and 275 mg of zinc."

On an ordinary mixed diet, Drinker, Fehnel, and Marsh (10) found an average excretion of 10.7 mg of zinc per day. One subject, following ingestion of the meal given above, excreted 200 mg of zinc on the next day. Such figures as these, coupled with animal experiments on feeding noncaustic zinc compounds, and with observations upon men working in zinc plants and showing zinc excretion averaging 48 mg a day, make it obvious that the mere fact of zinc ingestion is of no importance. Our concern is wholly with the zinc compound which reaches the stomach. It is possible that large amounts of zinc oxide would result in the formation of enough zinc chloride in the stomach to cause nausea, but the dosage must be great.

The facts are that practically all of the readily soluble salts of zinc are irritating or even caustic. Arranged in order of activity, the more common soluble compounds are about as follows: Zinc chloride, zinc sulphate, zinc acetate, zinc lactate, zinc tartrate, and zinc malate. Of this number, zinc chloride and zinc sulphate are not likely to contaminate food. The others are encountered fairly frequently and almost invariably because acid foods or beverages have been stored in galvanized containers. Many instances of nausea and of vomiting can be cited illustrating the inevitable result of disregard of this fact. The situation is so obvious as to make such quotations unnecessary. Zinc cannot be allowed to remain in contact with foods or beverages where moisture and acidity are encountered, without the possibility of results which may be decidedly unpleasant. This means that the householder should never cook or store food in galvanized utensils, and that brass utensils should not be used in cooking acid foods nor in storing foods or drinks. Zinc foil is a safe wrapper for dry and non-acid substances such as tea in the package or bar chocolate, but cannot, for example, be used on cheese because of the rapidity of corrosion.

2. ZINC IN RELATION TO INDUSTRIAL HYGIENE

In the course of the manufacture of zinc and zinc compounds, a single condition remains which calls attention to zinc, and this again is not due to a specific attribute of the metal but is apparently due to the physical state of certain zinc compounds. This is the familiar chill and fever formerly thought to be produced by zinc oxide alone but now known to occur when oxides or finely divided powders of other metals are inhaled. In typical cases following inhalation of

freshly formed zinc oxide or large amounts of old oxide, the worker after a few hours experiences malaise, then a severe shaking chill with a rise in temperature of considerable magnitude. Philip Drinker and his associates (12) (13) (14) (15) have studied these chills under circumstances permitting close clinical observation; that is, employing pure zinc oxide they have produced chills in themselves and in volunteers. Their findings were that ague occurs in from 2 to 4 hours after zinc-oxide inhalation. They found that in laboratory experiments 45 mg of zinc oxide (measured as zinc) per cubic meter of air can be inhaled for 20 minutes without causing symptoms. In a metallurgical plant 14 mg per cubic meter produced no reaction in 8 hours. Differences in susceptibility make it impossible to give absolute figures as to the concentrations certain to cause chills. Apparently no one is entirely immune, given a sufficiently large inhalation.

Philip Drinker found it easy to demonstrate the immunity which exists following a zinc chill, and this immunity is perhaps related to the leucocytosis which occurs with the chill and persists in many workmen exposed daily to zinc-oxide inhalation (1).

Batchelor, Fehnel, Thomson, and K. R. Drinker (1) made an exhaustive clinical and laboratory study of 24 workmen exposed over periods of time varying from 2 to 35½ years to the inhalation of varying concentrations of zinc in the form of zinc oxide, zinc sulphide, or fine metallic dust, and found no acute or chronic illness in any way ascribable to zinc. These observations are significant because the exposure to zinc was high and contamination by lead and cadmium was very low. Many of the men studied had often had zinc chills and, in addition, had experienced persistent dosage by inhalation.

Turner and Thompson (16) examined 212 brass founders and reported that those who experienced attacks of metal fume fever were "apparently in somewhat poorer condition than those exposed to the fumes but not affected by them."

One may sum up the evidence in regard to the zinc chill as follows: It is a decidedly unpleasant experience and, to a mild degree, incapacitates one the day following the attack. Where the inhaled oxide is uncontaminated by other metals, there is no definite evidence of chronic damage even from repeated chills. At the same time the condition is easy to prevent by properly arranged exhaust hoods or the wearing of masks, and conditions making chills possible should be eliminated. Mention has been made of the fact that the chill is not necessarily due to zinc. Philip Drinker (15) found it possible to produce fume fever in himself and his associate (R. M. Thomson) by inhaling magnesium oxide. The same result has been reported for other metals. The ease with which zinc assumes a physical or physico-chemical state capable of causing fume fever when inhaled

is apparently the reason why the condition has been thought to be due to zinc alone.

Finally, it is proper to mention a mechanical effect of zinc experienced in connection with zinc stearate dusting powders. Such powders have frequently caused death in infants who have inhaled them directly from the can. These instances have no bearing upon the problem of zinc toxicity. They occur when any dry, adhesive powder is inhaled in sufficient amount.

SUMMARY

A summary of the hygienic position of zinc with such restrictions as experience makes advisable is as follows:

1. In 1925, a publication of the Public Health Service (Reprint no. 1029) placed a limit of five parts per million of zinc in drinking water. This limit has been applied freely to many conditions in which zinc is ingested. Since the zinc ion is not of itself poisonous, and many times five parts per million may be taken without harmful effects, it is suggested that this limit, which gives a relatively innocuous metal an undeserved reputation for toxicity, be increased or done away with altogether.

2. Foods or beverages, with the exception of simple or chlorinated drinking water, should not be stored in zinc-lined or galvanized containers. Acid drinks and foods will invariably cause solution of zinc and the formation of simple compounds of zinc which irritate the stomach and may cause vomiting.

3. A single industrial condition arises from zinc and this condition is not produced by zinc alone. This is the "zinc chill", better known as metal fume fever. The different groups of symptoms described as chronic industrial zinc poisoning, together with other complex ills which have been ascribed to zinc, may be disregarded, as they are due to contamination by other substances.

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THE SIZE FREQUENCY OF INDUSTRIAL DUSTS

By J. J. Bloomfield, *Sanitary Engineer, United States Public Health Service*

The question as to the relative significance of various sizes of dust particles in the production of lung fibrosis has as yet not been satisfactorily answered by pathologists engaged on this problem. However, we do know that the inhalation of certain industrial dusts has been found to be associated with definite injury to the pulmonary tissues. Hence a knowledge of the size frequency of these dusts might cast some light on this problem. Of equal importance is the fact that such data will determine to a large degree the type of dust-sampling instrument and the method of dust counting to be employed in evaluating the industrial dust hazard.

Moir (1), Watkins-Pitchford (2), and Mavrogordato (3), of South Africa, have shown that the majority of the dust particles recovered by them from both human and animal silicotic lungs were between 1

and 3 microns in size. Only 13 percent of the particles were found to be less than 0.5 micron. These results have been recently checked by Scheid (4) of Germany. Drinker (5), in comparing the size frequency of the particles measured by Moir with the particles found by him in the sputum of men employed in ore mills, found a close correspondence. The results of these findings raise two pertinent questions; namely, (1) to what extent are minute particles of dust retained by the human lungs, and (2) do appreciable percentages of industrial dusts ever fragment into those minute sizes less than 0.5 micron?

The work of Drinker (6) and his associates and that of Brown (7) (8) on the retention of certain dusts and fumes by man when known amounts were breathed, seem to indicate that the coarser suspensions were retained more effectively than the more finely divided fumes. Percentage retention was found to be directly proportional to particulate size and to the density of dust suspended in the air. Owens (9), upon measuring the amount of dust in expired air of London inhabitants, found that only 25 percent of the dust was retained.[1] The average size of the dust inhaled in Owens' experiments was about 0.5 micron. This work on dust retention seems to bear out the theory that dust particles of a size less than 0.5 micron play but a small role in the problem of industrial dust inhalation and in a manner disposes of the first question raised. The answer to the second question—that is, the ability of the ordinary industrial process to fragment appreciable quantities of dust to a size less than 0.5 micron—is best answered by a particle-size study of the dusts actually suspended in industrial atmospheres.

The present contribution deals with such a study of the size frequency of certain industrial dusts encountered in the course of investigating the health of workers in dusty trades. In addition, a discussion is presented concerning the sampling and enumeration of aerial dusts in relation to the results obtained on the size range of such dusts.

INSTRUMENTS AND METHODS USED IN STUDY

In order to obtain a sample of dust from the air in more or less unaltered condition, the Owens jet dust counter (10) was used, since with this instrument the atmospheric dust is directly projected on a naked cover slip. Badham (11), in his study of the characteristics of this instrument, obtained correlations between the Owens and the impinger apparatus (12), and concluded from his study that the efficiency of the Owens counter is of the same order as the impinger,

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[1] In 1927 R. R. Sayers et al called attention to the fact that fine particulate matter such as lead dust from automobile exhaust gas was retained to an average extent of only 15 percent of the amount inhaled. (Experimental Studies on the Effect of Ethyl Gasoline and its Combustion Products, U.S. Bureau of Mines Monograph No. 2.)

for particles between 0.5 micron and 10 microns and that the results obtained by the Owens counter indicate, for all practical purposes, the dustiness of the air. Our own experience with this instrument also leads us to believe that it samples the dust in the air effectively, and especially the smaller sized particles.

After obtaining dust samples, the cover slips were mounted in the usual manner. The dust particles were measured by the use of a filar ocular micrometer (13) at a magnification of 1,000 diameters (oil immersion objective). The horizontal diameter of at least 200 dust particles in several representative fields was measured for each sample. With this magnification it was found possible to measure particles as small as 0.5 micron in size, while particles smaller than this size are easily distinguished at this magnification and their presence recorded.

Photographic methods have been suggested and used for measuring dust particles; but, in order to obtain good photomicrographs, it is essential that the dust particles be in one plane, free from Brownian movement and well dispersed. Since industrial dusts are seldom of a uniform size, it is difficult to fulfill the first requirement. At the beginning of this study a comparison was made between the results obtained with the direct filar measurements and the photographic method on a typical industrial dust sample. This comparison demonstrated that the simpler and less expensive filar method yielded practically the same results. Since the filar method fulfilled the requirements of our problem, it was selected for the present study.

RESULTS OF STUDY

Table 1 presents the results of the measurements of some 6,000 industrial dust particles and 18,000 outdoor dust particles. The latter measurements were obtained during the course of a study of the atmospheric smoke pollution problem in our large cities and are presented for the sake of comparison. The number of samples obtained for each dust, the median size,[2] and the average frequency in percent for each size group is indicated in this table. In all 26 samples of 11 different kinds of industrial dusts were examined. These dusts ranged from the dust present in sandblasting operations to that associated with the fine pulverizing operations in trap rock and talc milling plants.

[2] The median is the center item in an array and may be strictly defined as a point on the abscissal scale of a frequency distribution with 50 percent of the items on either side.

TABLE 1.—*Size-frequency distribution of various industrial dusts as compared to outdoor dust*

Kind of dust	Number of samples	Median	Average frequency in percent—Size group in microns											
			0 to 0.49	0.5 to 0.99	1.0 to 1.49	1.5 to 1.99	2.0 to 2.49	2.5 to 2.99	3.0 to 3.49	3.5 to 3.99	4.0 to 4.49	4.5 to 4.99	5.0 to 5.49	5.5 to 5.99
Outdoor dust	179	0.5	56.0	41.0	2.5	0.5	---	---	---	---	---	---	---	---
Sandblasting	9	1.4	1.4	19.7	34.7	20.3	12.6	5.2	2.8	1.6	1.1	0.2	0.2	0.2
Granite cutting	4	1.4	2.0	19.0	33.6	24.5	10.4	4.6	3.1	.6	.9	.3	1.0	---
Trap rock milling:														
Crusher house	1	1.4	0	13.0	39.0	33.0	10.5	2.5	2.0	---	---	---	---	---
Screen house	1	1.3	2.0	31.5	33.0	16.0	10.0	4.5	2.5	.5	---	---	---	---
Disk crusher	1	.9	10.0	48.0	31.0	6.0	3.0	1.0	1.0	---	---	---	---	---
Foundry parting compound	2	1.4	0.5	22.0	42.0	17.3	9.2	5.0	1.5	2.0	.5	---	---	---
General foundry air	1	1.2	0	26.0	48.0	17.0	8.0	1.0	---	---	---	---	---	---
Talc milling	1	1.5	0	16.0	32.0	20.0	13.0	7.0	5.0	2.0	2.0	2.0	0	1.0
Slate milling	1	1.7	1.0	13.0	29.0	17.0	14.0	14.0	6.0	4.0	1.0	0	1.0	---
Marble cutting	1	1.5	0	12.0	37.0	21.0	10.0	11.0	3.0	0	1.0	2.0	2.0	1.0
Soapstone dust	2	2.4	1.2	16.0	19.0	13.0	11.0	6.0	6.5	4.5	5.5	3.3	2.5	11.5
Aluminum dust	1	2.2	3.0	8.0	20.5	14.0	11.5	9.0	6.5	3.0	3.5	4.0	7.0	10.0
Bronze dust	1	1.5	1.0	12.0	33.5	25.0	21.0	6.0	1.5	---	---	---	---	---

An examination of the data in table 1 discloses a striking difference between the size frequency of outdoor dust and indoor industrial dust. Ninety-seven percent of the outdoor dust particles were found to be of a size less than 1 micron in diameter, with a median size of 0.5 micron. Practically no dust particles larger than 1.5 microns were found to exist in outdoor air. These results on the size frequency of outdoor dust are similar to those obtained by Owens in London (9). In contrast with this result we find that only 2 percent of the industrial dust particles are less than 0.5 micron, and but 21 percent less than 1 micron. The average (median) size of these particles was found to be 1.5 microns. It is evident from the results shown in table 1 that the majority (69 percent) of the dust particles present in industrial atmospheres investigated by the writer was found to be between one and three microns in average diameter, with but 10 percent of the particles exceeding 3 microns.

One of the interesting findings of the present study is revealed by the distribution shown in table 1, which indicates that although no two industrial dusts have the same size frequency, differing for the same dust created by different operations, yet for all practical purposes the dust particles fall into very narrow limits, the majority of them being between 1 and 3 microns. From this evidence on the particle-size distribution of industrial dusts in air it is apparent that our concern should be only for those particles ranging from 0.5 micron to 5 microns, and that the lower limit of particle size may certainly be taken at 0.5 micron.

An application of the size-frequency data presented in table 1 to some of the results obtained in studies of dust concentrations in industry reveals very interesting information. Figure 1 presents a comparison between the number of dust particles of different sizes

found in the general air of granite cutting plants and that found in outdoor air in the vicinity of these plants. The average dust counts for both the granite cutting plants (20.2) and the outdoor air (4.7 millions of particles per cubic foot) are based on about 50 samples obtained with the impinger apparatus. It is obvious that if we apply the size-frequency data shown in table 1 (computed with a class interval of 0.1 micron) to the average dust counts just cited, that in

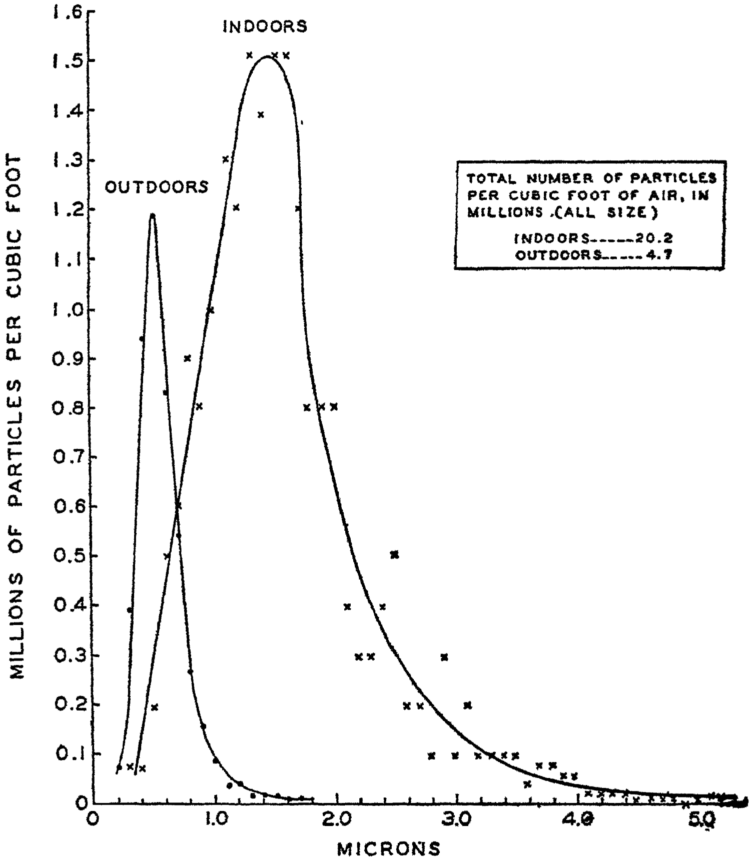

FIGURE 1.—Amount of dust of different sizes found in the general atmosphere of granite cutting plants in comparison with that outdoors in the vicinity of these plants.

the case of the indoor samples we cannot expect to obtain appreciable counts until the 0.7 micron size and larger sizes are reached, whereas apparently the opposite would hold true for the outdoor dust samples. This result is what one would expect from a consideration of the particle-size data of the two types of dusts and is merely presented to illustrate more lucidly the significance of the data. These results serve to indicate very clearly that if we are to differentiate between

dusts present in normal air (not proved to be harmful) and certain dusts found in industrial air (known to be hazardous), we should leave out of consideration those particles that are less than 0.5 micron in diameter. (The two curves actually cross at 0.6 micron.)

THE SAMPLING AND ANALYSIS OF INDUSTRIAL DUSTS

From the data presented in this paper it is apparent that in order to obtain a representative sample of industrial dust in air, one should employ an instrument capable of arresting with a high degree of efficiency all kinds of dust, of sizes ranging from 0.5 micron to 5 microns and at both low and high concentrations. In addition, the method of counting the dust in the samples should have small analytical errors and should reveal only those significant particles present in industrial atmospheres. It should not be the aim to count all the dust particles which may be present in the samples (as may be accomplished by either the use of high magnifications, dark-field illumination, or combinations of both), since it is necessary to differentiate between the dust content in normal air and industrial air. As has already been shown in this paper, this difference is sharply marked insofar as the dust particles between 0.5 micron and 5 microns are concerned; but this difference would be masked and lost should we include in our determination the particles of ultramicroscopic size which are present in vast numbers in all air.

Many methods have been devised and used for the purpose of determining the quantity of dust in air. Suffice it to say that for the purpose of dust sampling in either high or low concentrations, the Greenburg-Smith impinger apparatus (12) now finds universal favor. This instrument has been used by the United States Public Health Service in all of its dust studies for the past 10 years and is also being used by other workers in this country and abroad. Since this instrument has already been described in numerous publications, no further mention will be made at this time concerning construction details or method of operation. However, certain advantages that this instrument possesses over other dust sampling instruments should be mentioned. These are, briefly, a high dust collecting efficiency at both low and high concentrations (98 percent against finely divided silica dust), simplicity of construction, low cost, and finally it permits samples to be examined either microscopically, gravimetrically, or chemically. Recently, Hatch (14), in studying the operating characteristics of the modified impinger developed by him, investigated the effect of particle-size on the sampling efficiency of this instrument. Against a silica-dust suspension of approximately 1.5 microns average diameter, this instrument yielded an efficiency of more than 98 percent at the normal sampling rate of 1 cubic foot per minute. Even against very finely divided magnesium oxide fumes,

formed by burning magnesium ribbon in the flame of a blast lamp, this instrument showed an efficiency of 55 percent.

The method of dust counting employed by us during the past 10 years has been presented in detail elsewhere (12) (15). Recently, in order to establish the lower limit of particle size revealed by our standard microscopic technique, quartz dust particles ranging from 0.4 micron to 1.6 microns and averaging 0.9 micron were examined by this technique. This study showed that with our method of counting dust an experienced observer is capable of seeing quartz dust particles as small as 0.7 micron. Our size-frequency data shows that only 15 percent of the dust in industrial air is less than 0.7 micron. It is obvious, therefore, that our present method of counting dust is capable of disclosing about 85 percent of the dust particles collected by our instrument. The small percentage of dust our method fails to reveal is negligible, when one takes into consideration the simplicity of the method, the fact that results may be checked by trained observers, and that it is one of practical application.

The best criterion of the value of any method of measurement is its successful use in a practical application. Such a test was offered in the study of the health of workers exposed to the inhalation of granite dust (16). In this study it was definitely established that a high correlation existed between the intensity of exposure to dust and the degree of silicosis and active tuberculosis. It is obvious, therefore, that the technique of dust analysis which we have been using constitutes a valuable index of the hazardousness of dust inhalation.

SUMMARY

The results of measurements of 18,000 outdoor dust particles showed that nearly all of these are less than 1 micron in average diameter. The median size was found to be 0.5 micron. In contrast with this result it was found that only 21 percent of about 6,000 industrial dust particles were less than 1 micron in size, the majority (69 percent) being between 1 and 3 microns. The median size of the industrial dust particles was found to be 1.5 microns. These results clearly indicate that in conducting industrial dust studies our concern should be only for those particles ranging in size from 0.5 micron to 5 microns.

The instrument used in sampling industrial dust in air, the standard impinger apparatus, is shown to be capable of collecting, with a high degree of efficiency, dust particles of the sizes found in this study. The standard method used in enumerating dust particles is shown to take into account about 85 percent of the dust present in industrial atmospheres. In addition, our studies have shown that a high correlation exists between dust counts obtained with our technique and the degree of silicosis and tuberculosis found in a study of the health

of granite cutters. The present study clearly indicates that the method used in enumerating dust particles collected by the impinger apparatus constitutes a valuable and practical index of the hazardousness of dust inhalation.

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RELATION OF ARSENOXIDE CONTENT TO TOXICITY OF FRESH AND OLD SAMPLES OF ARSPHENAMINE

New Chemical Tests upon the Arsphenamines

By SANFORD M. ROSENTHAL, *Senior Pharmacologist*, and T. F. PROBEY, *Assistant Pharmacologist, National Institute of Health, United States Public Health Service*

The arsphenamines are easily oxidized into compounds of the arsenious oxide type, of which 3-amino-4-hydroxylphenyl arsenious oxide (designated as arsenoxide) is one of the primary products. Much work has been done by Voegtlin and coworkers (1) (2) (3) to demonstrate the role of this compound in trypanocidal action and in toxicity to the host of the arsphenamines.

In a recent communication (4) we have described a method for the estimation of arsenoxide based on a color reaction with beta-naphthoquinone under such conditions that the arsphenamines and all other arsenic compounds which we tested reacted negatively. With this method the importance of arsenoxide as an oxidation product of the arsphenamines was demonstrated *in vitro* and *in vivo*. *In vitro* from 30 to 40 percent concentrations could be reached in solutions of the arsphenamines when oxygen was bubbled through them at body temperature. In the animal body it was possible to demonstrate arsenoxide in the liver after injection of arsphenamine and in the kidney after injection of neoarsphenamine.

Since arsenoxide is approximately 10 times as toxic to animals as is arsphenamine, its presence in commercial samples becomes of importance, because the biological standardization of such samples is made upon a basis of toxicity. The presence of arsenoxide is of further significance because of the probable role that it would play in some of the untoward effects encountered in man following the therapeutic administration of arsphenamine.

In the present communication the arsenoxide test was carried out on commercial samples of arsphenamine to investigate two questions: (*a*) The relation between animal toxicity and the amount of arsenoxide in the sample; (*b*) whether arsphenamine becomes more toxic after several years of storage and if so whether such toxicity is due to the development of arsenoxide in the sample.

THE TEST

This test has been previously described (4). For application to commercial samples of arsphenamine the following technique is used:

The arsenoxide is extracted from the powder by dissolving 50 mg in 9.0 cc of water in a stoppered test tube or small flask. Five tenths cc of 50 percent cadmium sulphate is now added and the solution is mixed; 0.45 cc of 0.1 normal sodium hydroxide is then added drop by

drop, mixing the solution several times during the addition by inversion of the tube. The solution is now filtered; the filtrate should be acid to litmus as this prevents precipitation of appreciable amounts of the cadmium. The colorimetric test is now run upon the filtrate without letting it stand for any length of time. Filtrates obtained according to the method of Voegtlin and Smith (1) have also been employed in several instances with satisfactory results.

The test may be made upon 2.5 or 5 cc of the filtrate. To 5 cc in a test tube are added 2 cc of 10 percent sodium cyanide and then 2 cc of a 0.25 percent solution of 1.2 naphthoquinone-4-sodium sulphonate[1] made up in 10 percent sodium thiosulphate. This should be made up 10 minutes before addition. A layer of mineral oil is now run over the top of the solution. After this has stood for 20 minutes, 0.5 cc of 20 percent sodium sulphite is added and direct comparison is made with the standards.

By employing test tubes of the same size the comparison can be made directly with the standard tubes. For the standards five tubes are used, containing from 0.2 to 1.0 mg of arsenoxide in 4.75 cc of water plus 0.25 cc of 50 percent cadmium sulphate in each tube. They are tested simultaneously with the filtrates.

The color produced by the 0.2 mg standard, corresponding to 0.8 percent of arsenoxide in arsphenamine, is too weak for accurate comparison, and this amount of arsenoxide or less has been designated in the tables as a trace.

The procedure was checked by adding up to 4 percent of arsenoxide to several samples of arsenoxide-free arsphenamine and obtaining complete recovery. The cadmium sulphate serves a double purpose, aiding in the precipitation of arsphenamine and intensifying the color reaction. However, the intensification of the color varies directly with the amount of cadmium present, so that this should be approximately the same in the unknown as in the standard solution.

In the previous work it was found that ortho-aminophenol behaved similarly to arsenoxide in giving the color reaction, and a modification of the test with stannous chloride permitted a distinction to be made between these two compounds. We have applied this modification to samples of arsphenamine giving the color reaction and in no instance was o-aminophenol found to be present.

METHOD OF STUDY

The toxicity tests were carried out by one of us (T. F. P.) employing the official procedure regularly used in this laboratory for the biological standardization of these products, as described by Roth (5).

The concentration of the solution, the process of alkalization, the rate of intravenous injection, and the weight and source of the rats

[1] Obtained from the Eastman Kodak Co., Rochester, N.Y.

employed are all accurately controlled. Five rats were employed upon each dosage, and from 3 to 5 doses were necessary for each product. Some of the tests were carried out as part of the official standardization and the upper limits of toxicity (the M.L.D.), beyond the official requirements, were not established in all cases.

In the correlation of arsenoxide content with toxicity of arsphenamine it is necessary first to consider the toxicity of arsphenamine itself. Voegtlin, Johnson, and Dyer (6) have shown a relation between such physical characteristics as viscosity and toxicity and numerous observers have emphasized the importance of the colloidal nature of arsphenamine in its behavior upon intravenous injection (for reviews, see Voegtlin (7); Roth (8)). It is to be expected therefore that the basic toxicity of arsphenamine should show variations. Our studies have served to show that the toxicity of present-day products of arsphenamine which contain no appreciable arsenoxide varies from a M.L.D. of 180 mg to 220 mg per kilogram body weight when tested upon rats in this laboratory. In order to calculate the toxicity of a product containing arsenoxide we have taken 200 mg per kilo as the toxicity of the arsphenamine, and added to this figure the toxicity of the arsenoxide present, in order to arrive at a theoretical value for comparison with the actually determined toxicity. Accepting 200 mg per kilo as the dose of arsphenamine producing death in 80 percent of rats in 3 days, and 20 mg per kilo as the analogous M.L.D. of arsenoxide,[2] the theoretical M.L.D. was calculated according to the formula

$$10\frac{x}{100}M+\frac{100-x}{100}M=200$$

where x is the percentage of arsenoxide and M is the theoretical M.L.D. of the arsphenamine.

RESULTS

In table 1 are shown the results of tests on 35 samples of arsphenamine less than 1½ years old. A sufficiently close agreement was obtained between the theoretical toxicity based upon the arsenoxide content and the actual toxicity upon rats to conclude that the principal factor in causing increased toxicity is arsenoxide. Some variations occur, but they are no greater than would be expected in view of the errors inherent in the method of calculation, in the biological standardization, and in the test itself.

[2] In the previous papers the M.L.D. of arsenoxide was stated to be 26 mg per kilo. This was on a basis of 100 percent mortality. The above value is upon a basis comparable with that of arsphenamine.

TABLE 1.—*The arsenoxide content and toxicity of recent samples of arsphenamine. The theoretical toxicity is computed on a basis of 200 mg per kilo; M.L.D. as the toxicity of the arsphenamine itself plus the toxicity of the arsenoxide present. Under "found toxicity", + indicates that the M.L.D. was not determined, but was above the given value.*

Arsphenamine	Arsenoxide content	Theoretical toxicity	Found toxicity
Brand A			
Lot No.—	*Percent*	*mg/kilo, M.L.D.*	*mg/kilo, M.L.D.*
1	(1)	200	220
2	(1)	200	220
3	(1)	200	160+
4	(1)	200	160+
5	1.5	176	170–190
6	(1)	200	200
7	(1)	200	200
Brand B			
Lot No.—			
1	(1)	200	200+
2	(1)	200	160+
3	(1)	200	160+
Brand C			
Lot No.—			
1	3.5	150	140
2	2.0	170	140–170
3	3.5	150	150
4	1.0	147	180
5	(1)	200	160+
Brand D			
Lot No.—			
1	1.7	173	180
2	(1)	200	160+
3	1.6	174	160
Brand E			
Lot No.—	*Percent*	*mg/kilo, M.L.D.*	*mg/kilo, M.L.D.*
1	3.5	152	180
2	3.2	155	----------
3	2.8	159	----------
4	3.3	154	150
5	3.5	152	130–150
6	2.4	164	130
7	4.2	145	130
8	2.3	165	130–150
Brand F			
Lot No.—			
1	1.6	174	160+
2	1.5	176	180+
3	2.0	170	180+
4	(1)	200	180+
5	(1)	200	200+
6	(1)	200	200+
7	1.5	176	180
Brand G			
Lot No. 1	3.5	152	160
Brand H			
Lot No. 1	1.5	176	150+

[1] Trace (< 1 percent).

In order to investigate the problem of deterioration of arsphenamine with age, a group of samples was chosen that had been stored in a basement, protected from light, for 3 to 10 years. Eleven products were selected upon which satisfactory toxicity tests had been originally run, and whose original M.L.D. upon rats had been 200 mg or more per kilogram; the presence of arsenoxide in the sample when first tested was therefore unlikely.

Redetermination of toxicity tests upon rats revealed an increased toxicity that was roughly proportionate to the age of the drug. Estimation of the arsenoxide content revealed its presence in every case in sufficient quantity to account for the increase in toxicity (table 2). The effect of age on arsenoxide content is particularly brought out when one compares these samples with fresh samples of similar brands (table 1). One exception to these results was found. The two products of brand D when tested 9 years previously had shown the extremely low toxicities of 250 and 300 mg M.L.D. per kilo. The toxicity of these two samples showed no appreciable change after 9 years and no measurable amounts of arsenoxide could be detected in them. These products also furnish an example of how factors, other than arsenoxide, perhaps physicochemical, can influence the basic toxicity of arsphenamine, in this instance to bring about a product of unusually low toxicity.

TABLE 2.—*The increase in toxicity and presence of arsenoxide in old samples of arsphenamine. In computation of theoretical toxicity, the original M.L.D. was taken as the basic toxicity of the arsphenamine*

	Age of sample	Arsenoxide content	Original toxicity	Actual present toxicity	Theoretical present toxicity
Lot no.— *Brand A*	*Years*	*Percent*			
1	3	1.6	----------	----------	----------
2	5	1.6	200+	160	174
3	7	1.9	240	210	205
4	9	3.0	240	180	188
5	9	4.5	210	180	150
Lot no.— *Brand B*					
1	6	3.2	200	160	155
2	9	4.0	220	150	161
Brand D					
Lot no. 1	9	4.5	160-180	120	----------
Lot no.— *Brand F*					
1	9	(1)	250	250	250
2	9	(1)	300	260	300

INFLUENCE OF ALKALIZATION AND OF STANDING

Several experiments were conducted to study the influence of alkalization upon the arsenoxide content of arsphenamine. The standard method of alkalization was carried out, and the naphthoquinone test was performed upon the solution after reacidification with an equivalent quantity of hydrochloric acid.

It is seen from the results (table 3) that some increases in arsenoxide were present as a result of alkalization. When the alkaline solutions were permitted to stand in stoppered glass cylinders for 2 hours at room temperature, still further increases up to 2 percent were observed. The greatest increases (2 percent) occurred in two samples that were 3 and 5 years old; and this suggests that with some products old samples may be more unstable than fresh ones. Fresh samples that contained up to 4.2 percent of arsenoxide did not show any significant increases after the alkaline solutions had stood for 2 hours. However, more extensive tests must be made to establish these findings.

TABLE 3.—*The effect of alkalization and of 2 hours standing in stoppered cylinders of alkaline solutions of arsphenamine on the arsenoxide content*

Brand	Age	Arsenoxide content		
		Acid solution	Freshly alkaline solution	2 hours' standing
A. No.—		*Percent*	*Percent*	*Percent*
1	2 months	(1)	1.5	1.6
2	3 years	1.6	2.0	3.5
3	5 years	1.6	1.6	3.6
C. No.—				
1	1 year	3.5	4.2	4.2
2	2 months	1.2	1.5	2.6
E. No.—				
1	4 years	4.0	4.0	4.2
2	1 year	4.0	4.0	4.0
3	9 months	2.8	2.8	2.8
4	2 months	4.2	4.2	----------
5	6 months	2.4	2.2	2.8
F. No. 1	2 months	(1)	1.3	1.6

[1] Trace (<1%).

An attempt was made to apply the test for arsenoxide to neoarsphenamine. It was found, however, that in all samples there were present larger quantities of byproducts of a strongly reducing nature which inhibited the naphthoquinone color reaction. Up to the present time, various types of precipitation, including acids, alcohols, and heavy metals, singly or combined, have not proved satisfactory, as shown by incomplete recovery of added arsenoxide. From a considerable amount of work with these imperfect methods, the indications are that insufficient arsenoxide is present in commercial samples fully to account for variations in toxicity. This is in accord with the previous experiments on oxidized solutions of neoarsphenamine (4).

During this work a color reaction was observed which seemed worthy of further study. Certain samples of neoarsphenamine give a color from brown to deep red with a saturated solution of lead acetate. The reaction is observed chiefly in those samples of neoarsphenamine with sulpharsphenamine-like properties and also in sulpharsphenamine. The degree of color depends on the concentration of both constituents; we have adjusted the procedure so that in one concentration sulpharsphenamine reacts negatively and in another positively. Most fresh products of neoarsphenamine react negatively in all proportions.

(1) To 50 mg of neoarsphenamine or sulpharsphenamine in a small dry test tube add 1 cc of a saturated aqueous solution of lead acetate (sugar of lead) and stir immediately with a stirring rod. Sulpharsphenamine and typical neoarsphenamine remain light in color and do not dissolve.

(2) To 100 mg of powder add 0.5 cc of lead acetate and stir similarly. Sulpharsphenamine goes into solution with a deep red color. Typical neoarsphenamine remains light in color. Other samples vary from a brown coloration of the powder to a behavior similar to sulpharsphenamine.

That this procedure detects oxidation products in neoarsphenamine is indicated by the fact that certain products develop the color if the ampoules are left at 56° C. for 1 or more days. Analysis of the powder before and after heating, by Elvove's method (9), indicated that an oxidation had resulted from the heating.

Various chemicals were tried with the lead acetate solution to determine whether the color reaction resulted from byproducts present. All reacted negatively except sodium hydrosulphite ($Na_2S_2O_4$), which gave a red precipitate, changing to black lead sulphide within 10 minutes. The behavior was different from that of neoarsphenamine and sulpharsphenamine.

A SIMPLE PROCEDURE FOR DIFFERENTIATING THE ARSPHENAMINES

Occasionally it becomes necessary to identify a type of arsphenamine. The following procedure has satisfactorily fulfilled this requirement in a large number of samples which we have tested. It is carried out with the reagents ordinarily used for precipitation of blood by the Folin-Wu method of analysis.

To a small quantity of the powder, approximately 50 mg, in 5 cc of water, add 1 cc of 10 percent sodium tungstate; mix, and add 1 cc of 2/3 normal sulphuric acid.

Arsphenamine gives a bulky yellow precipitate. Sulpharsphenamine stays in solution for several hours without change in color, while neoarsphenamine develops a persistent deep blue-green color within a few minutes.

COMMENT

The toxicity of arsphenamine has been the subject of considerable investigation, and no uniformity of opinion exists as to the factors involved. In this laboratory the investigations of Voegtlin and coworkers have served to emphasize the importance, on the one hand, of physical characteristics (viscosity) and, on the other hand, of chemical changes with oxidation to arsenoxide.

In our previous work with the naphthoquinone test for arsenoxide the enhanced toxicity to rats of oxidized solutions of arsphenamine could be fully explained by the formation of arsenoxide, and that of sulpharsphenamine and neoarsphenamine could be partially so explained. The results upon commercial samples of arsphenamine and neoarsphenamine are in accord with these findings.

From a point of view of usefulness in testing arsphenamine for clinical use, the estimation of arsenoxide should be of value either as a supplement to animal toxicity or for use where the latter is not feasible. Concentrations of arsenoxide above 2.5 percent would be undesirable.

The demonstration that arsphenamine can deteriorate after several years of storage would emphasize the value of placing the date of release upon the ampoules. The process of deterioration is sufficiently slow as to involve no hardship on the manufacturer. Roth (10) has produced evidence of similar deterioration with neoarsphenamine.

The tungstic-acid color test is described as a simple means of differentiating between arsphenamine, neoarsphenamine, and sulpharsphenamine, with reagents available in most clinical laboratories.

While the lead acetate test upon neoarsphenamine could not be correlated with toxicity tests, it indicates chemical differences that cannot always be detected by other means. The methods of analysis of neoarsphenamine and sulpharsphenamine developed by Elvove (9) have demonstrated the wide variability among products, and it is

hoped that procedures which detect chemical differences may lead to a greater uniformity of manufacture. This is highly desirable for a drug of the importance of neoarsphenamine, particularly in view of the fact that it is administered by intravenous injection.

SUMMARY

The arsenoxide content and toxicity of 35 recent samples of arsphenamine were determined. A correlation sufficiently close was obtained to attribute the enhanced toxicity of certain products chiefly to arsenoxide.

Eleven samples of arsphenamine from 3 to 10 years of age, originally of low toxicity, were studied. With the exception of one product, an increase of toxicity roughly proportionate to the age was found. Sufficient arsenoxide was present to account for the increases in toxicity.

A color reaction between neoarsphenamine and lead acetate is described which detects chemical differences between various products.

A simple test to distinguish between arsphenamine, neoarsphenamine, and sulpharsphenamine, is described.

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STUDIES OF THE POLLUTION AND NATURAL PURIFICATION OF STREAMS

A Resurvey of the Ohio River Between Cincinnati, Ohio, and Louisville, Ky., with a Discussion of the Changes Since 1914–16 and the Effects of Canalization

During the period November 1929 to May 1931 the United States Public Health Service, in cooperation with the Kentucky State Board of Health and the Sewerage Commission of the City of Louisville, made a sanitary survey of the Ohio River between Cincinnati and Louisville in order to determine the changes in sanitary conditions since an investigation made some 15 years previously and to study

the effects of canalization of the river on the phenomena of natural stream purification. The results of this investigation have recently been made available in Public Health Bulletin No. 204.

The study included the collection of nearly 2,000 water samples for chemical and bacteriological examination; the tabulation of stream discharge, with estimates of times of flow; a study of existing sources of pollution, including the distribution of total and sewered population, and the waste-producing industries on the watershed.

Changes affecting the sanitary status of the river between Cincinnati and Louisville since the 1914–16 survey include the construction of 2 additional dams, making 4 dams between the 2 cities; an increase of 8 feet in the elevation of the dam at Louisville, lengthening the time of flow through the pool above that city; an increase in total population on the watershed above Cincinnati of 1,227,000 and between Cincinnati and Louisville of 433,000; an increase in sewered population within the zone of investigation of 212,000, making a total of 890,000 persons contributing untreated sewage to this section of the stream; and a possible decrease in industrial waste pollution because of the elimination of brewery and distillery waste and curtailed activity in other industrial establishments since the previous investigation.

The field and laboratory studies were conducted along lines similar to those of the original survey, and all procedures were closely coordinated and standardized, making the results of both investigations entirely comparable.

A study of the data collected has indicated that during winter periods of unobstructed flow, when stream discharge and channel conditions were essentially the same during both investigations, the amount of dissolved oxygen at the present time was approximately the same, the oxygen demand about one half, and the bacterial pollution somewhat higher, as compared with the winter periods of 1914–16.

In the present summer periods of pool stage, the average dissolved oxygen and the oxygen demand were both found to be less than in 1914–16, but the ratio of available to required oxygen was practically the same in both periods. However, during certain days in August 1930, when stream flows decreased to about 2,000 second-feet, the dissolved oxygen below Cincinnati was completely exhausted, indicating the marked effect of sewage and probably sludge deposits in the pool at Cincinnati.

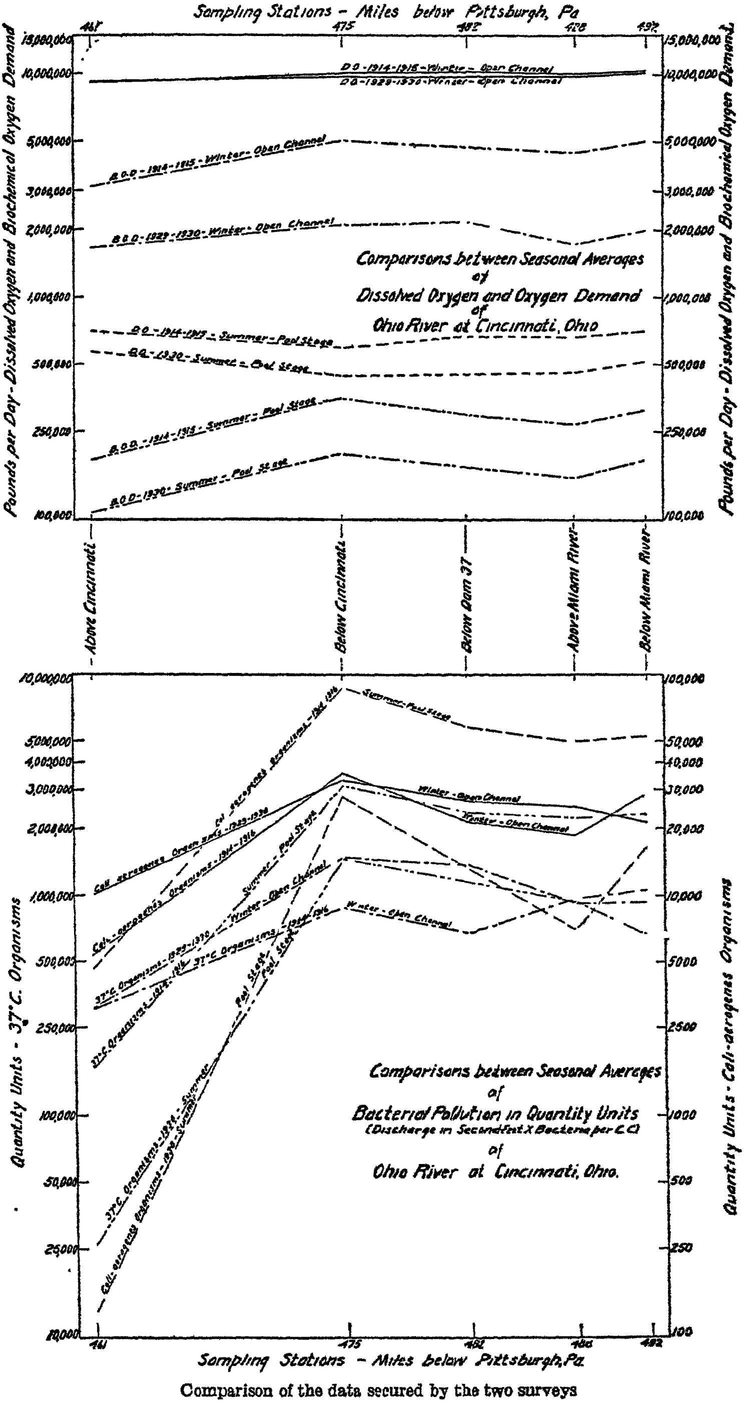
At the Cincinnati and Louisville waterworks intakes the bacterial concentration in the raw water was such that these plants, with highly elaborated processes of treatment, combined with efficient operation and supervision, were able to produce, without difficulty during a large part of the time, an effluent conforming to the Treasury Department standard for drinking water. The removal of turbidity in the pools, resulting in increased numbers of microscopic plants, during

pool stages, resulted in shortened filter runs and taste and odor troubles in the filter effluents.

The summer and winter rates of bacterial decrease below Cincinnati in 1929–30 were quite similar, as were also the 1929–30 and 1914–16 winter rates under comparable stream flow and channel conditions. During 1930, with much longer times of flow, due to complete canalization, rates of bacterial decrease were much less rapid than those of the summer months of 1914–16, with partial canalization. Decreasing velocities apparently lowered the bacterial concentration immediately below the zone of pollution, and the lower initial concentrations seemed to result in decreased rates of change further downstream. Initial concentration, however, does not appear to account entirely for differences in bacterial changes, and mechanical removal by sedimentation, differences in the condition or types of organisms present after long periods of flow, or the presence of larger microscopic organisms may be factors which influence rates of change under these conditions.

At times of unobstructed flow in the river a secondary increase in bacteria was indicated below the mouth of the Great Miami River, a tributary entering the main stream about 16 miles below the lower Cincinnati sewers, suggesting that rates of bacterial change may be affected by dilution, which disturbs, for a time at least, the biological balance of the stream.

Canalization, resulting in decreased velocities through the several pools, permits the sedimentation of sewage solids, which materially decreases the dissolved oxygen, with the possible creation of nuisances in the vicinity of the sewer outlets rather than at points downstream. These same conditions reduce considerably the bacterial load below the sources of pollution. While decreased bacterial loads at the waterworks intakes make the production of a satisfactory effluent less difficult, the reduced turbidity and increased numbers of microscopic organisms, resulting in shortened filter runs and possible taste and odor troubles in the treated water, more than offset the good effects of decreased bacterial loads. The concentration of decomposition products due to the fermentation of organic deposits within the pools may have public-health aspects not heretofore appreciated. Reference is made to the suspected water-borne outbreak of gastroenteritis along the Ohio River at the time of and following the low flows in the fall and winter of 1930–31. Canalization, at least between Cincinnati and Louisville, appears to have had the tendency to complicate, rather than simplify, the problems connected with sewage disposal, nuisance production, the operation of water-treatment devices, and the preservation of public health.



Comparison of the data secured by the two surveys

COURT DECISION RELATING TO PUBLIC HEALTH

State law and county ordinance regulating establishment of cemeteries held valid.—(Maryland Court of Appeals; *Gordon v. Commissioners of Montgomery County*, 164 A. 676; decided Feb. 15, 1933.) A legislative act of 1927 authorized the commissioners of Montgomery County to license and regulate graveyards within the county, and, in order to safeguard the public health, safety, and welfare, to pass ordinances for the purpose of executing the powers granted by the act. Proper standards for the exercise of the discretion conferred were to be contained in such ordinances, and there was to be uniform operation. The act declared unlawful the establishment or conduct of a cemetery without a license from the county commissioners, if required by any authorized ordinance. In pursuance of such law, the county commissioners passed an ordinance requiring a permit from them before any cemetery should be established or operated, and providing that no cemetery should be so located as to permit drainage of water into any well, spring, etc., used for drinking purposes by human beings, or as to endanger the safety and health of residents in the community. The ordinance also provided that no cemetery should be established within 500 yards of any school, hospital, sanitarium, or orphan asylum, or in any part of the county where there were then residing more than 100 persons within a radius of 500 yards of the outside limits of the burial reservation. Whenever, in the commissioners' opinion, the location of a cemetery would endanger the health, welfare, or safety of the public in its vicinity, a permit for its establishment there was to be refused.

The plaintiff brought an injunction suit to prevent the county commissioners from interfering with his effort to open and operate a cemetery in Montgomery County without applying for and obtaining a permit. It was his theory that the statute and ordinance were invalid and that he was therefore justified in disregarding their requirements. The contention was made that the county commissioners could not be constitutionally invested by the legislature with the power which the ordinance proposed to exercise.

The court of appeals held that the regulation of cemeteries in the interest of the public health was within the police power of the State and that the exercise of that power could be validly delegated by the legislature to a municipal corporation or other qualified agency of local government. "It is clearly within the powers and duties", said the court, "which the constitution declares may be conferred upon county commissioners."

The act under consideration was stated by the court not to attempt to confer upon the county an indefinite and wholly discretionary authority to grant or refuse permission to locate cemeteries, but required that the regulations on the subject should contain proper

standards to safeguard the public health and welfare and to govern uniformly the use of the delegated power. The standards prescribed by the commissioners were held to be clearly appropriate and adequate to fulfill the conditions under which the police power, when delegated by the State, could be validly applied by such a governmental agency as a county. Said the court:

> * * * Consideration is required to be given to the question of drainage, the number of adjacent residents, and the proximity of public institutions, within a specified distance, all with the distinct view to the protection of the public health. The only indicated ground for refusing a permit is a conclusion that the projected cemetery, in the location proposed, would endanger the health, welfare, or safety of the public in its vicinity. Proper compliance with the standards defined by the ordinance is an assurance against arbitrary discriminations or abuses of discretion. It is to be presumed that the action of the county commissioners on applications for cemetery permits will not disregard but will duly observe the limitations which the ordinance has imposed. * * *

As to the argument that the act was an invalid extension of the commissioners' authority into the field of legislative action, contrary to the historical limitation of their powers and in disregard of the home rule amendment to the State constitution, the court said that the fact that a county may formerly have been granted more limited legislative functions was far from being a conclusive reason why their powers could not be enlarged, and that the home rule amendment had no effect upon the question then being determined, as the privilege afforded by the amendment had not been exercised in Montgomery County.

The court closed its opinion as follows:

> The plaintiff was obligated by the terms of a valid statute and ordinance to obtain a permit from the County Commissioners of Montgomery County before proceeding to locate the cemetery which he has planned, and his suit for an injunction to aid him in that purpose, without any application having been made for such a permit, is not maintainable. The demurrer to the bill of complaint was correctly sustained for that reason. Leave to amend not having been utilized, the bill was properly dismissed.

DEATHS DURING WEEK ENDED JULY 22, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended July 22, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	6,772	7,549
Deaths per 1,000 population, annual basis	9.5	10.8
Deaths under 1 year of age	504	593
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	42	49
Deaths per 1,000 population, annual basis, first 29 weeks of year	11.3	11.8
Data from industrial insurance companies:		
Policies in force	67,722,700	71,774,641
Number of death claims	11,151	11,998
Death claims per 1,000 policies in force, annual rate	8.6	8.7
Death claims per 1,000 policies, first 29 weeks of year, annual rate	10.3	10.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended July 29, 1933, and July 30, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 29, 1933, and July 30, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended July 29, 1933	Week ended July 30, 1932	Week ended July 29, 1933	Week ended July 30, 1932	Week ended July 29, 1933	Week ended July 30, 1932	Week ended July 29, 1933	Week ended July 30, 1932
New England States:								
Maine		1	4		2	22	0	0
New Hampshire					23	3	0	0
Vermont		2			8	7	0	0
Massachusetts	19	37			120	147	2	1
Rhode Island		1		2		7	0	0
Connecticut	4	3	2	1	22	34	0	0
Middle Atlantic States:								
New York	30	39	[1] 1	[1] 4	261	445	7	3
New Jersey	12	15	3	1	77	141	0	0
Pennsylvania	26	31			228	184	5	5
East North Central States:								
Ohio	11	24	30	6	19	87	1	1
Indiana	10	26	19	19	10	7	1	8
Illinois	11	26	19	16	50	73	3	2
Michigan	20	16	3		87	293	0	1
Wisconsin	3	4	10	12	38	101	0	2
West North Central States:								
Minnesota	7	3	1	4	24	17	0	2
Iowa [2]	2	6			4	3	2	0
Missouri	19	12		2	21	13	1	1
North Dakota	2	6			20	5	3	1
South Dakota							1	0
Nebraska	3	3				4	0	0
Kansas	7	6			12	16	0	0
South Atlantic States:								
Delaware							1	0
Maryland [2, 3]	3	6	9		11	7	0	0
District of Columbia [3]	2	9	1	2	4	2	0	0
Virginia [3, 4]	7	9			18	87	0	0
West Virginia	10	7	1		3	51	0	2
North Carolina [3, 4]	20	22	3	26	51	79	0	0
South Carolina [4]	8	8	72	74	33	24	0	2
Georgia [4]	19	8		10	21		0	0
Florida [4]	1	5	1		15	2	0	0
East South Central States:								
Kentucky	6	8					3	0
Tennessee	8	3	4	2	25	2	0	1
Alabama [4]	11	19	4	4	10	1	1	1
Mississippi [2]	10	7					0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 29, 1933, and July 30, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended July 29, 1933	Week ended July 30, 1932	Week ended July 29, 1933	Week ended July 30, 1932	Week ended July 29, 1933	Week ended July 30, 1932	Week ended July 29, 1933	Week ended July 30, 1932
West South Central States:								
Arkansas	4	5	1	2	27		0	0
Louisiana	8	13	9	1	20	31	1	0
Oklahoma [5]	9	17	8	7	18	5	1	0
Texas [4]	57	36	63	38	69	5	3	1
Mountain States:								
Montana [3]	1	1			8	56	0	0
Idaho [3]		3	3		1		1	0
Wyoming [3]	1				9	3	0	0
Colorado [3]	4	6			5	2	0	0
New Mexico	1	9			3	1	1	1
Arizona	1	2		2	2		1	0
Utah [2]	2				23	2	0	0
Pacific States:								
Washington		1			25	8	0	0
Oregon	1		9	7	28	14	0	0
California	37	26	18	32	169	54	1	2
Total	426	491	298	274	1,624	1,995	40	37

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended July 29, 1933	Week ended July 30, 1932	Week ended July 29, 1933	Week ended July 30, 1932	Week ended July 29, 1933	Week ended July 30, 1932	Week ended July 29, 1933	Week ended July 30, 1932
New England States:								
Maine	0	1	6	5	0	0	2	3
New Hampshire	0	0	10	6	0	0	0	0
Vermont	0	0	3	2	0	0	1	0
Massachusetts	24	1	85	105	0	0	4	5
Rhode Island	0	1	6	9	0	0	0	1
Connecticut	2	0	14	19	0	0	2	1
Middle Atlantic States:								
New York	45	6	90	122	0	4	22	31
New Jersey	4	2	34	43	0	0	11	7
Pennsylvania	8	19	122	116	0	0	29	30
East North Central States:								
Ohio	3	5	124	96	0	0	31	56
Indiana	0	0	10	20	0	3	19	28
Illinois	7	10	89	73	2	14	25	36
Michigan	3	2	76	75	1	1	7	11
Wisconsin	0	4	20	12	2	0	2	9
West North Central States:								
Minnesota	10	3	9	22	2	0	0	1
Iowa [2]	0	3	10	10	4	4	1	4
Missouri	1	0	15	29	0	2	23	40
North Dakota	5	1		2	1	9	0	5
South Dakota	0	0	2	1	0	2	2	3
Nebraska	0	0	2	1	1	3	0	1
Kansas	1	1	12	13	0	2	6	19
South Atlantic States:								
Delaware	0	0			0	0	1	3
Maryland [2 3]	0	0	29	16	0	0	15	23
District of Columbia [3]	0	0	3	7	0	0	4	4
Virginia [3 4]	1	2	20	11	0	0	55	55
West Virginia	2	1	7	4	0	0	25	50
North Carolina [3 4]	0	2	24	35	0	2	33	59
South Carolina [4]	0	0	3	1	0	0	36	56
Georgia [4]	0	0	3	5	0	0	50	77
Florida [4]	2	0	1	2	0	0	7	6
East South Central States:								
Kentucky	1	2	6	20	0	6	116	108
Tennessee	7	1	12	7	0	3	86	141
Alabama [4]	0	0	12	7	0	0	43	29
Mississippi [2]	0	1	5	5	0	2	8	39

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 29, 1933, and July 30, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended July 29, 1933	Week ended July 30, 1932	Week ended July 29, 1933	Week ended July 30, 1932	Week ended July 29, 1933	Week ended July 30, 1932	Week ended July 29, 1933	Week ended July 30, 1932
West South Central States:								
Arkansas	0	2	6	--------	0	4	23	29
Louisiana	1	0	6	4	0	0	28	71
Oklahoma [5]	0	0	8	8	0	1	39	48
Texas [4]	1	5	21	23	18	8	103	40
Mountain States:								
Montana [3]	0	0	1	2	0	4	5	4
Idaho [3]	0	0	2	1	1	0	4	6
Wyoming [3]	1	0	4	2	0	0	1	0
Colorado [2]	0	0	6	8	0	0	1	5
New Mexico	0	0	--------	3	0	0	1	16
Arizona	0	0	2	1	0	2	3	2
Utah [4]	0	0	1	--------	0	0	0	1
Pacific States:								
Washington	0	1	8	14	1	5	3	4
Oregon	0	1	4	6	3	4	7	3
California	4	6	61	39	5	9	9	10
Total	133	83	994	1,012	41	94	893	1,179

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Rocky Mountain spotted fever, week ended July 29, 1933, 14 cases as follows: Maryland, 3; District of Columbia, 1; Virginia, 1; North Carolina, 3; Montana, 2; Idaho, 1; Wyoming, 2; Colorado, 1.
[4] Typhus fever, week ended July 29, 1933, 80 cases as follows: North Carolina, 2; Virginia, 3; South Carolina, 5; Georgia, 16; Florida, 4; Alabama, 27; Texas, 23.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
June 1933										
Alabama	5	37	23	184	137	97	2	37	4	65
California	13	133	69	7	3,375	9	12	486	63	38
Idaho	--------	3	1	--------	22	--------	0	4	8	8
Kansas	2	17	1	2	492	--------	1	72	5	32
Montana	--------	--------	8	--------	118	--------	0	47	1	21
Nevada	--------	--------	--------	--------	4	--------	--------	--------	4	--------
North Carolina	4	36	27	--------	1,497	213	1	99	1	112
Oklahoma [1]	2	19	41	110	337	12	1	30	7	70
Oregon	1	7	62	1	138	--------	0	67	72	10
Puerto Rico	--------	44	54	2,498	177	3	0	--------	0	57
Texas	8	158	316	728	--------	81	3	134	--------	156
Virginia	2	29	60	13	710	45	1	110	--------	71
Washington	2	13	25	--------	272	--------	1	82	31	13
Wisconsin	3	20	54	--------	834	--------	1	317	26	8

[1] Exclusive of Oklahoma City and Tulsa.

June 1933

	Cases
Actinomycosis:	
California	1
Botulism:	
Washington	3
Chicken pox:	
Alabama	18
California	1,555
Idaho	13
Kansas	91
Montana	70

June 1933—Continued

	Cases
Chicken pox—Contd.	
Nevada	13
North Carolina	116
Oklahoma [1]	17
Oregon	75
Puerto Rico	39
Virginia	195
Washington	606
Wisconsin	1,924
Conjunctivitis:	
Oklahoma [1]	1

June 1933—Continued

	Cases
Diarrhea and dysentery:	
Virginia	1,384
Dysentery:	
California, amebic	3
California, bacillary	9
Oklahoma [1]	36
Puerto Rico	252
Filariasis:	
Puerto Rico	5
Food poisoning:	
California	32

[1] Exclusive of Oklahoma City and Tulsa.

June 1933—Continued

	Cases
German measles:	
California	52
Kansas	85
North Carolina	4
Washington	15
Granuloma, coccidioidal:	
California	1
Impetigo contagiosa:	
Montana	7
Oklahoma [1]	1
Oregon	7
Washington	4
Leprosy:	
Puerto Rico	1
Lethargic encephalitis:	
Alabama	4
California	1
Texas	3
Virginia	2
Washington	3
Wisconsin	1
Mumps:	
Alabama	38
California	877
Idaho	4
Kansas	107
Montana	4
Nevada	1
Oklahoma [1]	5
Oregon	5
Puerto Rico	19
Virginia	71
Washington	118
Wisconsin	254
Ophthalmia neonatorum:	
Alabama	2
California	4
North Carolina	2
Oklahoma [1]	1
Oregon	1
Puerto Rico	7
Virginia	3
Paratyphoid fever:	
California	2
Idaho	1
Kansas	3
Montana	1
North Carolina	2

June 1933—Continued

	Cases
Paratyphoid fever—Con.	
Puerto Rico	7
Texas	13
Virginia	12
Psittacosis:	
California	1
Puerperal septicemia:	
Puerto Rico	7
Rabies in animals:	
California	49
Washington	19
Rabies in man:	
Oklahoma [1]	2
Rocky Mountain spotted fever:	
California	7
Idaho	10
Montana	19
Nevada	3
Oregon	16
Virginia	4
Washington	1
Scabies:	
Oklahoma [1]	1
Oregon	11
Septic sore throat:	
California	7
Kansas	2
Montana	7
North Carolina	8
Oklahoma [1]	14
Oregon	3
Virginia	6
Tetanus:	
Alabama	8
California	8
Kansas	1
Oklahoma [1]	1
Puerto Rico	7
Virginia	4
Tetanus, infantile:	
Puerto Rico	17
Tick paralysis:	
Montana	1
Trachoma:	
California	4
Montana	1
Oklahoma [1]	5

June 1933—Continued

	Cases
Trachoma—Continued.	
Puerto Rico	2
Virginia	1
Washington	1
Trichinosis:	
California	5
Tularaemia:	
California	2
Idaho	2
Kansas	2
Montana	14
Nevada	1
Virginia	3
Washington	1
Typhus fever:	
Alabama	56
North Carolina	4
Undulant fever:	
Alabama	5
California	7
Idaho	1
Kansas	12
Montana	3
Nevada	1
North Carolina	1
Oregon	1
Virginia	1
Washington	2
Wisconsin	7
Vincent's angina:	
Kansas	6
Montana	2
Oklahoma [1]	1
Oregon	8
Washington	2
Whooping cough:	
Alabama	195
California	1,471
Idaho	8
Kansas	365
Montana	25
Nevada	5
North Carolina	972
Oklahoma [1]	43
Oregon	19
Puerto Rico	1[illegible]0
Virginia	348
Washington	57
Wisconsin	1,322

[1] Exclusive of Oklahoma City and Tulsa.

WEEKLY REPORTS FROM CITIES

City reports for week ended July 22, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	1	-------	0	0	2	0	0	0	0	4	14
New Hampshire:											
Concord	0	-------	0	0	0	0	0	0	0	0	8
Nashua	0	-------	0	0	0	0	0	0	0	0	0
Vermont:											
Barre	0	-------	0	6	0	0	0	3	0	4	4
Burlington	0	-------	0	0	0	0	0	0	0	0	10
Massachusetts:											
Boston	4	-------	0	79	12	35	0	12	0	40	158
Fall River	0	-------	0	3	1	6	0	1	0	20	32
Springfield	0	-------	0	0	0	6	0	2	1	5	28
Worcester	3	-------	0	20	0	3	0	4	2	5	45
Rhode Island:											
Pawtucket	0	-------	0	0	0	0	0	0	0	0	12
Providence	8	-------	0	0	2	2	0	3	1	35	49
Connecticut:											
Bridgeport	0	-------	0	3	1	5	0	1	0	5	29
Hartford	2	-------	0	3	0	6	0	0	0	0	29
New Haven	0	-------	0	1	1	0	0	1	0	4	34

City reports for week ended July 22, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
New York:											
Buffalo	2		1	24	8	5	0	6	1	20	139
New York	22	1	2	103	59	35	0	83	31	116	1,225
Rochester	0		0	0	0	1	0	0	1	22	58
Syracuse	0		0	0	2	2	0	0	0	4	31
New Jersey:											
Camden	0		0	0	0	3	0	1	1	0	17
Newark	0	1	0	6	4	3	0	1	3	37	64
Trenton	0		0	13	1	3	0	0	3	7	19
Pennsylvania:											
Philadelphia	2		1	101	16	38	0	23	4	11	330
Pittsburgh	1		1	1	2	15	0	7	2	88	133
Reading	1		0	0	1	0	0	3	0	1	24
Ohio:											
Cincinnati	0	1	0	5	0	9	0	10	4	13	96
Cleveland	1	12	0	2	7	17	0	13	0	40	144
Columbus	3		0	0	2	12	0	3	0	0	72
Toledo	2		0	8	2	17	0	3	0	14	61
Indiana:											
Fort Wayne	3		0	0	4	0	0	1	1	0	16
Indianapolis	1		0	12	5	2	0	3	0	5	
South Bend	0		0	1	1	0	0	0	0	1	16
Terre Haute	0		0	0	0	1	0	0	1	0	26
Illinois:											
Chicago	1	1	0	55	14	60	0	36	2	107	558
Springfield	0		0	0	0	0	0	0	0	0	18
Michigan:											
Detroit	4	3	0	5	4	17	0	24	3	124	246
Flint	3		0	1	1	2	0	0	1	7	18
Grand Rapids	0		0	1	0	1	0	0	0	5	36
Wisconsin:											
Kenosha	0		0	1	0	0	0	0	0	20	6
Madison	0		0	0		0	0		0	7	
Milwaukee	0		0	0	2	10	0	5	0	136	81
Racine	0		0	0	1	0	0	0	0	40	10
Superior	0		0	0	0	0	0	0	0	7	4
Minnesota:											
Duluth	0		0	10	0	0	0	0	0	26	14
Minneapolis	2		0	4	2	7	0	2	0	12	83
St. Paul	0		0	5	1	4	0	1	0	55	53
Iowa:											
Des Moines	0			0		1	0		0	0	27
Sioux City	0			1		0	0		0	3	
Waterloo	0			0		0	0		0	3	
Missouri:											
Kansas City	1		0	0	5	3	0	6	1	13	74
St. Joseph	0		0	0	2	1	0	1	0	0	20
St. Louis	11			8	3	5	0	4	4	29	190
North Dakota:											
Fargo	0		0	0	0	1	0	0	0	0	1
South Dakota:											
Aberdeen	0		0	0	0	0	0	0	0	0	
Nebraska:											
Omaha	0		0	6	0	3	1	2	0	9	47
Kansas:											
Topeka	0		0	1	1	0	0	0	0	1	16
Wichita	0		0	0	1	0	0	0	0	14	27
Delaware:											
Wilmington	0		0	1	1	0	0	0	0	11	27
Maryland:											
Baltimore	0	1	1	0	10	16	0	17	3	76	175
Cumberland	0		0	0	0	0	0	1	0	0	14
Frederick	0		0	0	0	0	0	0	0	0	2
District of Col.:											
Washington	0	1	0	12	4	2	0	8	0	6	134
Virginia:											
Lynchburg	1		0	8	0	2	0	0	0	32	5
Norfolk	0		0	2	2	0	0	1	6	0	36
Richmond	0		0	2	1	0	0	3	2	10	39
Roanoke	0		0	0	0	1	0	0	1	2	19
West Virginia:											
Charleston	1		0	0	2	0	0	0	1	1	22
Wheeling	0		0	0	1	1	0	0	0	6	13
North Carolina:											
Raleigh	0		0	0	0	0	0	0	0	1	10
Wilmington	0		0	0	0	0	0	0	0	0	9
Winston-Salem	0		0	0	0	2	0	0	0	2	11

City reports for week ended July 22, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
South Carolina:											
Charleston	0	5	0	0	2	0	0	4	3	6	19
Columbia	0	-------	0	0	2	0	0	0	0	0	17
Greenville	0	-------	0	0	0	0	0	0	1	0	9
Georgia:											
Atlanta	4	10	0	4	4	1	0	2	6	10	70
Brunswick	0	-------	0	0	0	0	0	0	0	0	2
Savannah	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Florida:											
Miami	2	-------	0	0	2	0	0	1	0	4	27
Tampa	0	-------	0	0	1	0	0	1	0	0	24
Kentucky:											
Ashland	0	-------	0	0	0	0	0	0	1	10	1
Lexington	0	-------	0	1	1	0	0	0	0	1	12
Louisville	1	-------	0	0	3	1	0	5	3	3	74
Tennessee:											
Memphis	0	-------	3	15	7	1	0	5	1	14	81
Nashville	0	-------	0	1	3	2	0	1	0	13	43
Alabama:											
Birmingham	0	-------	0	1	1	4	0	4	1	2	44
Mobile	3	-------	0	2	0	0	0	0	1	0	24
Montgomery	0	-------	-------	0	-------	0	0	-------	1	3	-------
Arkansas:											
Fort Smith	0	-------	-------	0	-------	0	0	-------	0	1	-------
Little Rock	0	-------	0	0	4	0	0	3	0	0	7
Louisiana:											
New Orleans	6	1	1	2	8	2	0	13	7	0	146
Shreveport	0	-------	0	0	3	1	0	0	0	0	25
Oklahoma:											
Olkahoma City	3	-------	-------	4	1	1	0	2	2	-------	35
Tulsa	0	-------	0	0	0	1	0	0	1	7	-------
Texas:											
Dallas	1	-------	0	0	3	5	0	2	4	2	66
Fort Worth	0	-------	0	0	4	0	0	2	2	0	30
Galveston	0	-------	0	0	0	0	0	1	0	0	12
Houston	5	-------	0	2	3	3	0	2	5	0	54
San Antonio	0	-------	0	0	5	0	0	2	0	1	58
Montana:											
Billings	0	-------	0	0	0	0	0	0	0	0	3
Great Falls	0	-------	0	0	2	0	0	0	0	4	6
Helena	0	-------	0	0	0	0	0	0	0	0	5
Missoula	0	-------	0	1	2	0	0	1	0	0	7
Idaho:											
Boise	0	-------	0	0	0	0	0	0	0	1	5
Colorado:											
Denver	0	-------	1	3	5	6	0	2	0	9	76
Pueblo	0	-------	0	0	1	0	0	0	0	2	11
New Mexico:											
Albuquerque	0	-------	0	0	0	0	0	2	0	8	8
Utah:											
Salt Lake City	0	-------	0	17	0	2	0	0	0	9	33
Nevada:											
Reno	0	-------	0	0	1	0	0	0	0	0	2
Washington:											
Seattle	1	-------	-------	0	-------	1	0	-------	0	21	-------
Spokane	0	-------	-------	14	-------	2	0	-------	0	0	-------
Tacoma	0	-------	0	2	2	3	0	0	0	1	18
Oregon:											
Portland	0	-------	0	1	1	4	6	0	0	4	40
Salem	0	3	0	1	0	0	0	0	0	0	-------
California:											
Los Angeles	9	8	2	29	7	11	1	23	0	58	236
Sacramento	0	-------	0	1	1	1	0	3	0	11	28
San Francisco	0	2	0	1	2	3	0	10	1	10	157

City reports for week ended July 22, 1933—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths	
Massachusetts:			
Boston	0	0	15
Worcester	0	0	1
New York:			
New York	1	1	18
New Jersey:			
Newark	0	0	1
Pennsylvania:			
Philadelphia	1	0	0
Pittsburgh	0	0	2
Ohio:			
Cleveland	1	0	0
Indiana:			
Indianapolis	1	0	0
Illinois:			
Chicago	0	1	5
Michigan:			
Detroit	0	0	2
Flint	0	1	0
Minnesota:			
Minneapolis	0	0	1
St. Paul	0	0	2
Missouri:			
St. Joseph	1	0	0
North Dakota			
Fargo	0	0	1
Nebraska:			
Omaha	0	1	0
South Dakota:			
Aberdeen	0	0	1
Maryland:			
Baltimore	0	1	0
Cumberland	1	1	0
District of Columbia:			
Washington	1	0	0
West Virginia:			
Wheeling	0	0	1
North Carolina.			
Raleigh	0	1	0
Georgia:			
Atlanta	1	0	0
Tennessee:			
Nashville	0	0	2
Alabama:			
Birmingham	1	1	0
Arkansas:			
Little Rock	0	0	1
Louisiana:			
New Orleans	1	0	0
Texas:			
Dallas	0	0	1
Houston	0	0	2
California:			
Los Angeles	0	0	1
San Francisco	1	0	0

Lethargic encephalitis.—Cases: New York, 4; Pittsburgh, 1.

Pellagra.—Cases: Baltimore, 2; Charleston, S.C., 3; Miami, 2; Memphis, 1; Mobile, 1; New Orleans, 2; Dallas, 1.

Typhus fever.—Cases: New York, 2; Atlanta, 1; Tampa, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—Two weeks ended July 15, 1933.—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the 2 weeks ended July 15, 1933, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis			1	1	4					6
Chicken pox		3		73	313	24	60	6	102	581
Diphtheria		1	3	23	18	10	5	1		61
Erysipelas				13		1		2		16
Influenza		8				10			19	37
Measles			1	138	67		2		16	224
Mumps					79	9	7	1	18	114
Pneumonia					11				3	14
Poliomyelitis		1		4			1		1	7
Scarlet fever		5	6	54	73	24	1	4	19	186
Trachoma									2	2
Tuberculosis	1	5	24	134	102	11	51	5	34	367
Typhoid fever			7	27	11	6		3	1	55
Undulant fever					9		1			10
Whooping cough			6	134	250	154	15	27	42	628

Quebec Province—Communicable diseases—Ten weeks ended July 15, 1933.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 10 weeks ended July 15, 1933, as follows:

Disease	Two weeks ended—				
	May 20	June 3	June 17	July 1	July 15
Botulism					1
Cerebrospinal meningitis	1		3		1
Chicken pox	329	293	272	134	73
Diphtheria	46	28	26	15	23
Erysipelas	7	12	7	9	13
German measles	21	3	6	6	5
Influenza	5	1	5		
Measles	478	642	388	177	133
Ophthalmia neonatorum			1	2	
Poliomyelitis	1		5	1	4
Puerperal septicemia	2	3	2	1	
Scarlet fever	103	80	78	64	54
Tuberculosis	164	127	106	150	134
Typhoid fever	60	25	36	37	27
Undulant fever		2			
Whooping cough	112	133	167	93	134
Other communicable diseases	132	104	119	64	30

CHILE

Santiago—Typhus fever.—According to information dated July 19, 1933, the epidemic of typhus fever in Santiago, Chile, had reached major proportions. On July 13, 325 cases were said to exist in the city, 294 of which were in hospitals. This represented a great increase over the weekly average of 45.1 cases from January 1 to June 10, 1933.

The present epidemic of typhus was said to have occurred first in the south-central section of the country during June and July, 1932, and later to have become prevalent in Santiago where it found fertile field for propagation in concentration camps of unemployed workers and in the poorer sections of the city.

EGYPT

Notifiable diseases—Year 1932.—The following table gives the number of cases of certain diseases reported in Egypt during the year 1932. The figures are provisional.

Disease	Cases	Disease	Cases
Anthrax	23	Poliomyelitis and polioencephalitis	11
Cerebrospinal fever	4, 503	Puerperal septicemia	604
Chicken pox	740	Rabies	2, 337
Diphtheria	1, 990	Relapsing fever	1
Dysentery	2, 117	Scarlet fever	102
Erysipelas	2, 996	Smallpox	600
Influenza	5, 731	Tetanus	532
Leprosy	119	Tuberculosis, pulmonary	3, 580
Lethargic encephalitis	13	Typhoid fever	3, 653
Malaria	1, 343	Typhus fever	2, 298
Measles	19, 649	Undulant fever	10
Mumps	796	Whooping cough	3, 305
Plague	134		

NICARAGUA

Influenza.—Information has been received, dated July 19, 1933, of an epidemic of influenza at Puerto Cabezas, Nicaragua, and in the surrounding territory. During the 2 weeks ended July 15, 304 cases of influenza, with 6 deaths, were reported.

PUERTO RICO

Notifiable diseases—4 weeks ended July 15, 1933.—During the 4 weeks ended July 15, 1933, cases of certain notifiable diseases were reported in the municipalities of Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chicken pox	32	Ophthalmia neonatorum	9
Colibacillosis	1	Paratyphoid fever	1
Diphtheria	37	Pellagra	3
Dysentery	238	Puerperal fever	3
Erysipelas	3	Ringworm	3
Filariasis	3	Syphilis	22
Framboesia	2	Tetanus	4
Influenza	42	Tetanus, infantile	2
Leprosy	2	Trachoma	1
Malaria	2, 543	Tuberculosis	415
Measles	128	Typhoid fever	35
Mumps	16	Whooping cough	152

YUGOSLAVIA

Communicable diseases—June 1933.—During the month of June 1933 certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	41	3	Paratyphoid fever	12	
Cerebrospinal meningitis	11	7	Scarlet fever	212	6
Diphtheria and croup	424	43	Sepsis	12	6
Dysentery	26	2	Tetanus	56	23
Erysipelas	171	9	Typhoid fever	216	20
Measles	595	8	Typhus fever	136	8

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for July 28, 1933, pp 896–906. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued August 25, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

China—Tientsin.—During the week ended July 1, 1933, two cases of cholera were reported in Tientsin, China.

India.—During the week ended July 8, 1933, cholera was reported in certain cities of India as follows: Bombay, 1 case, 2 deaths; Calcutta, 24 cases, 2 deaths.

Indo-China, French—Saigon and Cholon.—During the week ended July 15, 1933, Saigon and Cholon reported 1 case of cholera with 1 death.

Philippine Islands—Opon.—During the week ended July 29, 1933, 8 cases of cholera with 6 deaths were reported in Opon, Cebu Province, Philippine Islands.

Plague

Egypt—Alexandria.—During the week ended July 22, 1933, Alexandria, Egypt, reported two cases of plague.

Indo-China, French—Saigon and Cholon.—During the week ended July 8, 1933, Saigon and Cholon reported 1 case of plague with 1 death.

Iraq—Baghdad.—During the week ended July 22, 1933, Baghdad reported 1 case of plague with 1 death.

India—Bombay.—During the week ended July 22, 1933, Bombay reported 1 case of plague with 1 death.

Smallpox

China.—Certain cities in China have reported smallpox as follows: During the week ended July 1, 1933, Nanking reported 1 case of smallpox; Shanghai reported 3 cases with 1 death. During the week ended July 15, 1933, Hong Kong reported 1 case with 1 death.

Syria—Beirut.—During the week ended July 22, 1933, Beirut, Syria, reported three cases of smallpox.

Typhus Fever

Algeria.—During the week ended July 8, 1933, typhus fever has been reported in certain places in Algeria as follows: Constantine Department, 20 cases; Oran, 1 case.

Egypt.—Certain cities of Egypt have reported typhus fever as follows: During the week ended July 22, 1933, Alexandria reported 1 case with 1 death. During the week ended July 15, 1933, Cairo reported three cases of typhus fever.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

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Estimation of Basophilic Cells from Ordinary Blood Film
Deaths in Large Cities During the Week Ended July 29
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 48 AUGUST 18, 1933 NO. 33

VARIATIONS OF GROWTH IN WEIGHT OF ELEMENTARY SCHOOL CHILDREN, 1921–28[1]

By CARROLL E. PALMER, M.D., *Consultant in Child Hygiene, United States Public Health Service*[2]

It is a fact of broad general experience, now supplemented by the analysis of extensive quantitative data, that the growth of plant and animal organisms varies within wide limits in different calendar years. It will be conceded, however, that organisms which develop under the influence of direct cultivation or domestication, where at least part of the deficiencies of particularly unfavorable growing years are artificially supplied, show less variation than similar organisms which depend entirely on a natural environment. Thus, human children, in populations of civilized and prosperous nations, develop in environments which remain fairly uniform from year to year. Recent work (Schlesinger (1), Wolff (2), Martin (3), and others), however, on the growth of children whose infancy and early childhood coincided with the unfavorable conditions of the recent war and post-war period, has shown the marked extent to which growth may vary in different years. In the United States at the present time, economic conditions have developed which make the determination of their effects upon the health of children an urgent public-health problem. Questions concerning the effect of the economic depression on the growth of children can be answered definitely only when adequate control standards are available. As far as is known, standards are not available which will furnish a quantitative measure of the "normal" variation that is associated with the growth of children living under fairly uniform conditions of nutrition and environment. It is with this point in view, therefore, that records in the archives of the Office of Field Investigations in Child Hygiene of the United States Public Health Service are being analyzed to provide the necessary control series. This paper, although based upon too few cases and too short

[1] From the Office of Field Investigations in Child Hygiene, United States Public Health Service, in cooperation with the Department of Biostatistics (Paper No. 172) of the School of Hygiene and Public Health, the Johns Hopkins University.

[2] The investigation, during which the data used in this paper were collected, was begun under the direction of Assistant Surgeon General Taliaferro Clark, formerly officer in charge of field investigations in child hygiene. The field observations were made under the immediate supervision of Past Assistant Surgeon R. B. Norment, jr. The writer is indebted to these officers of the United States Public Health Service and to Acting Assistant Surgeon E. Blanche Sterling, Senior Statistician S. D. Collins, and Miss Katherine Schindel, field worker, for assistance in the interpretation of the data.

a period to give completely conclusive results, purposes to give a tentative answer to the specific question, What is the variation in successive calendar years of growth in body weight of children between 6 and 15 years of age, living under fairly constant and reasonably satisfactory environmental conditions?

The investigation of the problem is of importance from several other points of view. First, in connection with more general and less urgent public-health programs, it is necessary to determine the range of normal variation of growth in successive years in order to evaluate quantitatively the effect and effectiveness of various public-health proceedings and activities. Second, it is important, in connection with the anthropological studies of Jackson (4), Hansen (5), Hultkrantz (6), and others, on the variations and evolutionary changes in the average values of certain body measurements, to determine the cumulative effect upon the growth and final size of the human body of a succession of particularly favorable or particularly unfavorable "growing" years. And, third, it is becoming increasingly clear to those interested in the analysis of anthropometric measurements that, despite standardization of nomenclature and methods, and extreme care and accuracy in the taking of measurements, there are still many unconsidered sources of variation which require study.

MATERIAL AND METHODS

The material for the inquiry is derived from the records of an investigation of the growth of elementary school children made during the years 1921 to 1928 by the United States Public Health Service at Hagerstown, Md. Some of these records were used in a previous paper (7), to which the reader is referred for information concerning the methods and other details of the investigation.

The data consist of measurements of body weight, recorded in October and May of each year, of the children attending the elementary grade schools in Hagerstown. All of the weighings made during the period from October 1923 through May 1928 were made by Miss Katherine Schindel, a thoroughly competent field worker in the employ of the Public Health Service. Weighings in May and October 1922 and in May 1923 were made by the various grade-school teachers, each of whom weighed the children in her own class. During the first year of the study, all of the children in all of the elementary schools of the city were weighed. In the second year, the weights of only the children in the first four grades of the school were recorded. In the third year, children in the second through the fifth grades, inclusive, were weighed, and thereafter in each succeeding year one lower grade was eliminated from, and one higher grade was added to, the group being measured. From the records obtained, those belonging to white native-born children having complete weight protocols for 4 years or

more were chosen for tabulation and study. The data thus made available consist of serial measurements for periods varying from 4 to 7 years of approximately 2,500 different children whose ages range from 6 to 15 years.

It must be noted that the children who make up successive age groups are not identically the same children in successive years of the study. However, a fairly large proportion of the children first observed at 6 years of age were followed individually through the ages of 10, 11, and 12 years, and many of the children first observed at 10 years of age were followed through the ages of 14 or 15 years. Thus, although there is considerable change in the actual constituents of the different age groups in consecutive years, all individuals who are included in a specified age group in a specified year were born during the same calendar year and possess, therefore, nearly identical past histories with regard to the calendar years during which growth occurred.

Attention must be called, also, to the fact that relatively more young children were measured in the early years of the study, and relatively more older children were measured in the later years of the study. It is impossible, now, to evaluate explicitly the effect of this selective factor. It seems reasonable to believe, however, that the major conclusions of the investigation are not vitiated by such selection.

Measurements of weight were recorded to the nearest quarter pound, and include regular indoor clothing with the exception of shoes, coats, sweaters, and vests. Each of the eight elementary schools of the city was provided with a separate scale which was calibrated at the beginning of each school year. Thus, the chance for serious systematic errors, arising from inaccuracies of the weighing machines, is probably not large.

The day of the month on which weight was measured varied slightly from year to year. The average intervals between weighing days in May were calculated (except for 1922–23 and 1923–24, for which data were unavailable) as follows:

1924–25	372 days
1925–26	357 days
1926–27	359 days
1927–28	364 days

It has been shown (7) that average growth in weight during the month of May is approximately 0.1 pound per child per 30-day period. Thus, differences in annual growth (May to May), which may be effected by variation in number of days in the different years, would not average more than 0.05 pound and are considered negligible. Variations of the date of weighing in October averaged about 10 days; but, because weights recorded at that time will be used here only for the study of actual weights (not increments), corrections for this variation were not considered necessary.

TABLE 1.—*Constants of frequency distributions of annual (May to May) gains in weight in successive years, elementary school children, Hagerstown, Md., 1922–23 to 1927–28*

	Boys							Girls						
	1922–23	1923–24	1924–25	1925–26	1926–27	1927–28	All years	1922–23	1923–24	1924–25	1925–26	1926–27	1927–28	All years
7-YEAR AGE CLASS														
Number of cases	45	63	83	61	7	-----	259	44	65	80	71	6	-----	266
Mean ... pounds	4.75	5.18	4.54	4.54	5.09	-----	4.75	5.03	5.30	4.25	4.61	5.38	-----	4.76
Median ... pounds	4.53	4.84	4.43	4.41	4.71	-----	4.53	4.61	4.76	3.96	4.47	5.55	-----	4.50
σ ... pounds	1.96	2.02	1.44	1.47	1.28	-----	1.70	3.07	2.60	1.73	1.91	1.00	-----	2.26
8-YEAR AGE CLASS														
Number of cases	113	116	188	169	74	7	667	114	109	173	149	87	7	639
Mean ... pounds	5.85	5.66	5.25	5.39	6.20	6.23	5.57	5.37	5.50	4.78	5.01	5.28	3.95	5.12
Median ... pounds	5.70	5.38	5.18	5.16	6.01	6.63	5.40	4.96	5.13	4.51	4.74	5.18	3.71	4.81
σ ... pounds	1.90	2.02	2.10	1.93	1.86	2.36	1.99	2.74	3.53	1.93	2.00	1.70	1.05	2.18
9-YEAR AGE CLASS														
Number of cases	95	122	195	209	170	76	867	80	122	165	196	156	86	805
Mean ... pounds	6.51	5.76	5.30	5.81	6.02	5.82	5.81	5.79	5.48	5.62	5.45	6.36	6.22	5.78
Median ... pounds	5.86	5.38	5.00	5.53	5.96	5.59	5.53	5.53	4.88	4.80	5.12	5.79	5.69	5.26
σ ... pounds	2.48	3.20	1.96	2.25	2.08	2.07	2.33	2.45	2.92	2.95	2.65	3.21	2.67	2.85
10-YEAR AGE CLASS														
Number of cases	35	97	165	218	214	162	891	31	86	166	186	195	155	819
Mean ... pounds	5.98	5.84	5.76	6.04	6.59	6.21	6.13	6.83	6.60	5.79	6.96	7.20	7.18	6.78
Median ... pounds	5.71	5.45	5.42	5.83	6.19	6.01	5.81	5.67	6.35	5.30	6.21	6.27	6.38	6.07
σ ... pounds	2.48	3.19	2.72	2.53	2.59	2.60	2.67	3.13	2.87	2.93	3.69	3.74	3.42	3.41
11-YEAR AGE CLASS														
Number of cases	18	37	136	186	214	204	795	8	37	129	173	199	189	735
Mean ... pounds	6.99	5.73	6.32	6.56	6.91	7.38	6.80	9.63	7.59	7.68	7.76	9.46	8.95	8.52
Median ... pounds	6.88	5.52	5.88	6.04	6.50	6.64	6.30	10.38	6.63	7.01	6.96	8.65	7.82	7.54
σ ... pounds	3.00	2.27	3.12	3.14	2.75	3.96	3.24	2.73	3.93	4.21	3.71	4.81	4.76	4.39
12-YEAR AGE CLASS														
Number of cases	3	22	53	157	189	197	621	-----	9	55	143	177	188	573
Mean ... pounds	5.04	6.28	6.45	7.92	8.40	7.92	7.87	-----	9.15	9.90	10.24	10.74	11.61	10.79
Median ... pounds	5.13	5.13	5.69	6.74	6.78	7.16	6.70	-----	10.05	8.38	9.93	10.33	11.45	10.35
σ ... pounds	0.47	3.13	3.26	4.30	4.77	4.03	4.24	-----	4.54	5.59	4.47	4.81	5.39	5.00
13-YEAR AGE CLASS														
Number of cases	-----	3	29	64	149	175	420	-----	4	15	61	138	170	388
Mean ... pounds	-----	10.38	7.82	8.84	11.09	10.22	10.15	-----	11.63	10.58	11.02	12.45	11.90	12.05
Median ... pounds	-----	6.38	7.38	6.59	9.53	9.15	8.76	-----	10.88	11.01	11.18	12.51	11.45	11.66
σ ... pounds	-----	6.38	4.02	5.91	5.90	5.58	5.66	-----	6.42	3.41	6.03	5.17	4.69	5.08
14-YEAR AGE CLASS														
Number of cases	-----	-----	5	39	60	127	232	-----	-----	6	22	55	119	202
Mean ... pounds	-----	-----	6.58	10.73	12.84	13.82	12.88	-----	-----	9.54	9.38	12.16	10.48	10.79
Median ... pounds	-----	-----	6.38	10.76	12.38	13.80	12.59	-----	-----	9.88	8.38	12.13	10.63	11.09
σ ... pounds	-----	-----	4.53	5.12	5.93	6.12	5.88	-----	-----	3.62	4.34	5.45	5.18	5.14
15-YEAR AGE CLASS														
Number of cases	-----	-----	-----	4	37	41	83	-----	-----	-----	6	22	37	65
Mean ... pounds	-----	-----	-----	6.63	13.92	13.01	13.16	-----	-----	-----	7.21	8.01	9.02	8.51
Median ... pounds	-----	-----	-----	4.88	12.63	13.63	12.76	-----	-----	-----	3.88	8.88	10.13	9.24
σ ... pounds	-----	-----	-----	2.49	6.24	6.42	6.20	-----	-----	-----	4.60	3.90	7.60	6.32

TABLE 2.—*Constants of frequency distributions of weight in October in successive years, elementary school children, Hagerstown, Md., 1921–27*

	Boys								Girls							
	1921	1922	1923	1924	1925	1926	1927	All years	1921	1922	1923	1924	1925	1926	1927	All years
6-YEAR AGE CLASS																
Number of cases	42	34	93	62	7	-----	-----	238	28	47	87	68	7	-----	-----	237
Mean..pounds	44.40	43.38	44.26	44.42	45.07	-----	-----	44.23	44.71	43.88	42.75	43.01	42.50	-----	-----	43.28
σ.......pounds	5.34	4.65	4.49	4.66	4.62	-----	-----	4.72	6.51	5.20	4.45	4.97	4.14	-----	-----	5.02
7-YEAR AGE CLASS																
Number of cases	70	89	178	177	75	7	-----	596	68	75	180	157	85	8	-----	573
Mean..pounds	48.53	47.95	47.43	47.64	48.29	49.33	-----	47.83	46.41	47.90	45.99	46.24	46.85	45.25	-----	46.48
σ.......pounds	7.25	5.44	5.30	5.70	4.75	4.09	-----	5.63	6.49	7.01	5.59	4.36	5.03	3.00	-----	5.51
8-YEAR AGE CLASS																
Number of cases	60	106	186	214	191	74	8	839	56	113	173	209	166	86	8	811
Mean..pounds	53.00	53.19	52.36	52.43	52.85	53.43	53.88	52.75	51.93	51.22	51.74	50.88	50.99	51.62	50.00	51.28
σ.......pounds	7.85	7.81	6.92	6.42	6.76	6.02	4.12	6.86	5.86	7.58	7.52	6.58	5.25	6.55	4.00	6.63
9-YEAR AGE CLASS																
Number of cases	21	79	176	221	222	153	76	973	23	80	175	188	211	156	88	921
Mean..pounds	56.26	58.41	57.58	57.58	58.32	57.89	59.18	57.97	54.15	54.36	54.95	58.05	56.58	56.09	56.66	56.24
σ.......pounds	6.36	7.78	7.99	7.69	7.66	7.64	7.01	7.66	6.50	6.44	7.83	9.75	8.14	6.51	7.40	7.96
10-YEAR AGE CLASS																
Number of cases	4	30	141	196	223	219	179	992	4	32	137	188	203	203	158	925
Mean..pounds	53.25	60.10	63.65	63.34	63.49	63.87	63.95	63.51	60.50	59.91	60.93	61.11	64.41	61.94	62.54	62.20
σ.......pounds	6.83	10.46	9.36	9.80	9.27	9.03	8.67	9.26	7.58	9.53	9.28	9.82	11.52	10.04	8.07	9.91
11-YEAR AGE CLASS																
Number of cases	-----	13	60	160	212	213	210	868	-----	6	53	151	188	199	201	798
Mean..pounds	-----	70.42	66.05	69.90	63.97	69.73	71.03	69.89	-----	61.50	65.84	67.63	67.67	71.76	69.97	69.09
σ.......pounds	-----	11.18	9.75	11.42	11.83	10.82	11.12	11.19	-----	5.42	10.06	11.15	10.55	14.47	13.03	12.32
12-YEAR AGE CLASS																
Number of cases	-----	2	31	70	167	198	213	681	-----	3	19	66	150	187	189	614
Mean..pounds	-----	58.50	69.60	72.00	77.29	76.74	76.84	76.04	-----	62.50	71.66	75.20	76.62	76.63	82.15	77.95
σ.......pounds	-----	5.00	10.70	10.67	12.83	14.34	12.78	12.97	-----	11.31	10.57	14.88	13.80	14.53	17.59	15.30
13-YEAR AGE YEAR																
Number of cases	-----	-----	6	42	73	150	195	466	-----	-----	5	25	69	140	176	415
Mean..pounds	-----	-----	68.83	77.38	80.53	85.97	85.88	84.09	-----	-----	76.30	84.22	85.75	87.64	88.10	87.18
σ.......pounds	-----	-----	8.50	12.51	13.27	16.21	17.60	16.03	-----	-----	12.67	14.59	18.20	16.92	16.25	16.69
14-YEAR AGE CLASS																
Number of cases	-----	-----	-----	5	43	63	144	255	-----	-----	-----	6	26	61	127	220
Mean..pounds	-----	-----	-----	72.30	86.97	90.83	97.90	93.79	-----	-----	-----	84.17	92.77	96.61	99.04	97.22
σ.......pounds	-----	-----	-----	10.11	14.14	17.19	20.21	18.39	-----	-----	-----	12.62	15.91	21.30	16.35	17.73
15-YEAR AGE CLASS																
Number of cases	-----	-----	-----	2	7	36	46	91	-----	-----	-----	-----	6	22	39	67
Mean..pounds	-----	-----	-----	90.50	89.79	98.17	101.48	99.03	-----	-----	-----	-----	93.67	100.41	111.65	106.35
σ.......pounds	-----	-----	-----	16.00	19.06	17.54	17.40	17.56	-----	-----	-----	-----	13.06	16.48	20.38	18.61

The reduction of the data consists of the analysis of frequency distributions, specific for age, sex, and year of measurement of (*a*) annual gains in weight and (*b*) actual weights. The age classification was for single years of life, age being taken as of the birthday nearest January 1. Gains in weight were calculated as the difference between the weights on the May preceding and the May following the January date of age classification. Distributions of actual weight were formed for measurements taken in October (the October preceding the January date of age classification).

Results of the analysis of the frequency distributions are given in tables 1 and 2. Table 1 shows the mean, median, and standard deviation (σ) of annual gains in weight in the different years for children in the specified age classes. Under the captions "All years" are given means and medians of the distributions specific for age and sex, but unspecified with regard to the year of measurement. The standard deviations entered in these columns are weighted averages of the standard deviations of distributions for the different years of measurement. This method for calculating the variability of gains for separate age groups would appear to give a more precise measure of dispersion than standard deviations calculated in the usual manner from distributions formed by combining the data without regard for the year of measurement. Table 2 shows the mean and standard deviation (σ) of distributions of actual weights in October for children of different ages weighed in different years. As in table 1, the columns marked "All years" give the means for the October weights unspecified for year of measurement and the standard deviations calculated as the average weighted standard deviations of the distributions for the different years of measurement.

RESULTS

Mean yearly gains.—Study of table 1 shows the usual variations with age and sex of the average annual weight increments, and the presence, during the 7-year interval, *of a systematic variation of annual gains for children in the same age and sex classes.* The primary interest in this investigation concerns the latter variation; and in order to facilitate comparisons between the different age groups, mean gains for the different years of measurement were expressed as percentages [3] of the means for "all years." These percentages are represented [4] graphically in figure 1. Here it is shown that mean gains, for each sex and for each age observed, tend to be higher in 1922–23 than the

[3] For example, the mean annual gain of 6-year-old boys during 1924–25 equalled 4.54 pounds; the mean annual gain of 6-year-old boys for the entire period (all years) equalled 4.75 pounds; the percentage value for the year 1924–25 equals, therefore,

$$\frac{4.54}{4.75} \text{ times } 100, \text{ or } 95.6 \text{ percent.}$$

[4] Printing limitations do not allow the tabulation of these values, but the basic data are given completely in table 1.

averages based upon a total of 7 years' observation. Gains in 1923–24 show an irregular fluctuation about the "all years" averages, but in 1924–25 mean annual increments are markedly reduced, both sexes and all age groups showing a marked decrease in growth. Gains in 1925–26 are generally greater than those of the previous year, and in 1926–27 growth increments are uniformly higher than at any time during the period of observation. In the last year, 1927–28, the mean gains are still above the averages, but show a slight reduction from those of the previous year. There are, of course, irregular random fluctuations of the individual groups, particularly evident for the averages based upon small numbers of cases; but it is possible, generally, to show statistically significant differences of the more divergent years. The most convincing evidence of a distinct fluctuation of growth in different years is to be found, however, in the consistency with which variations occur in the two sexes and in children of different ages. In order to bring out this consistency, the graph shown in the top section of figure 1 is presented. The data for the graph consist of weighted averages, specific for the calendar years of measurement, of percentage gains for all age groups combined. This procedure furnishes a quantitative summary of differences between the different years. Thus, in 1922–23, the growth in weight of boys, all ages taken together, exceeded by 5 percent the "all years" averages of the boys. At the same time, girls of all ages gained 3 percent more than their 7-year averages. The records of the most divergent years, 1924–25, with gains of less than 92 percent of the averages for boys and 91 percent of the averages for girls; and 1926–27, with gains of 105 percent of the averages for boys and 106 percent of the averages for girls, show that, in as short an interval as 3 successive calendar years, annual growth in weight may vary as much as 15 percent (the difference between 91 and 106 percent).

Median yearly gains.—Although it is generally known that frequency distributions of annual weight increments form only slightly skewed curves, it seemed advisable to determine the medians of the distributions and to consider whether or not the observed variation of the means is due essentially to a few aberrent measurements. Accordingly, table 1 furnishes medians of the distribution, and figure 2 shows the trends of the medians for each age group, together with a summary trend for children of all age groups combined. As in figure 1, the medians for the different years of measurement are expressed as percentages of the medians of distributions unspecified with regard to the year of measurement.

The results of the analysis confirm in every essential detail the conclusions drawn from the study of the means. The changes of the medians for the different years follow the same general trends as the changes of the means; the two most divergent years, 1924–25 and

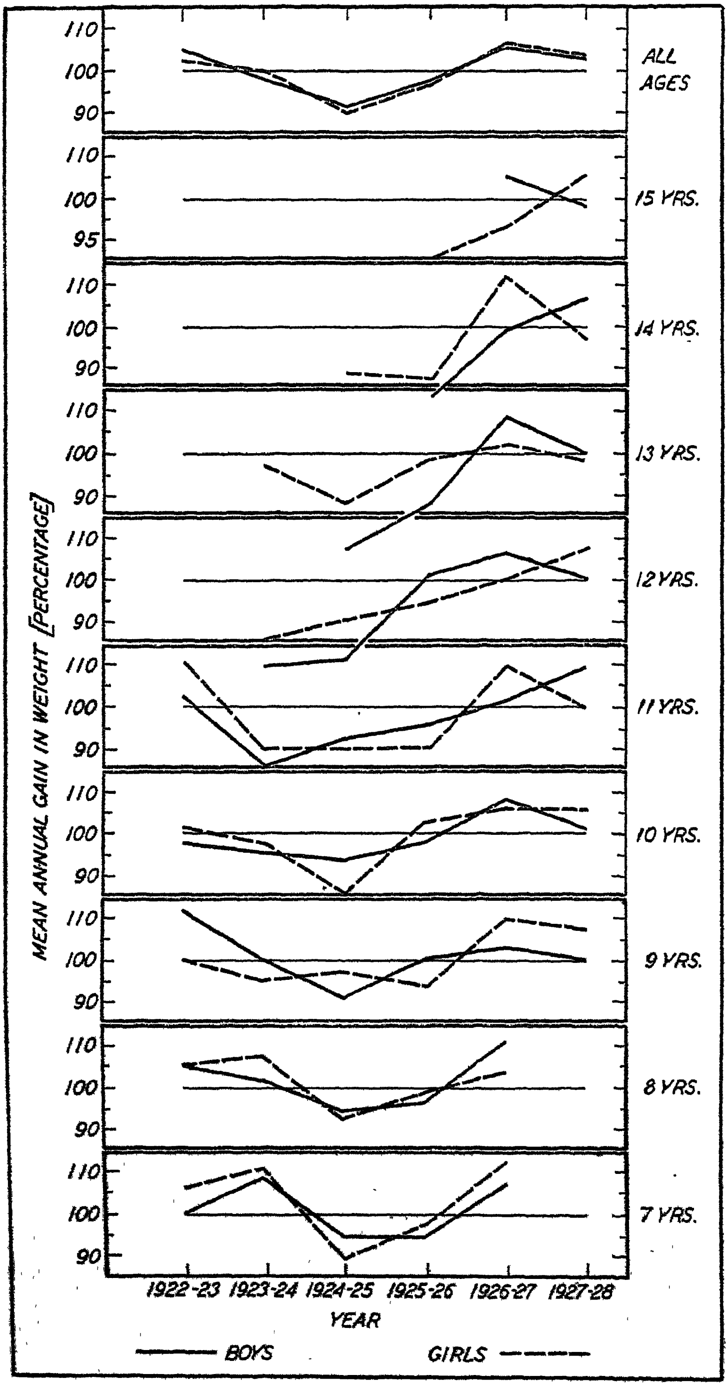

FIGURE 1.—Percentages: Mean annual gains in weight in specific years of mean annual gains all years combined. (White, native-born, elementary school children, Hagerstown, Md.)

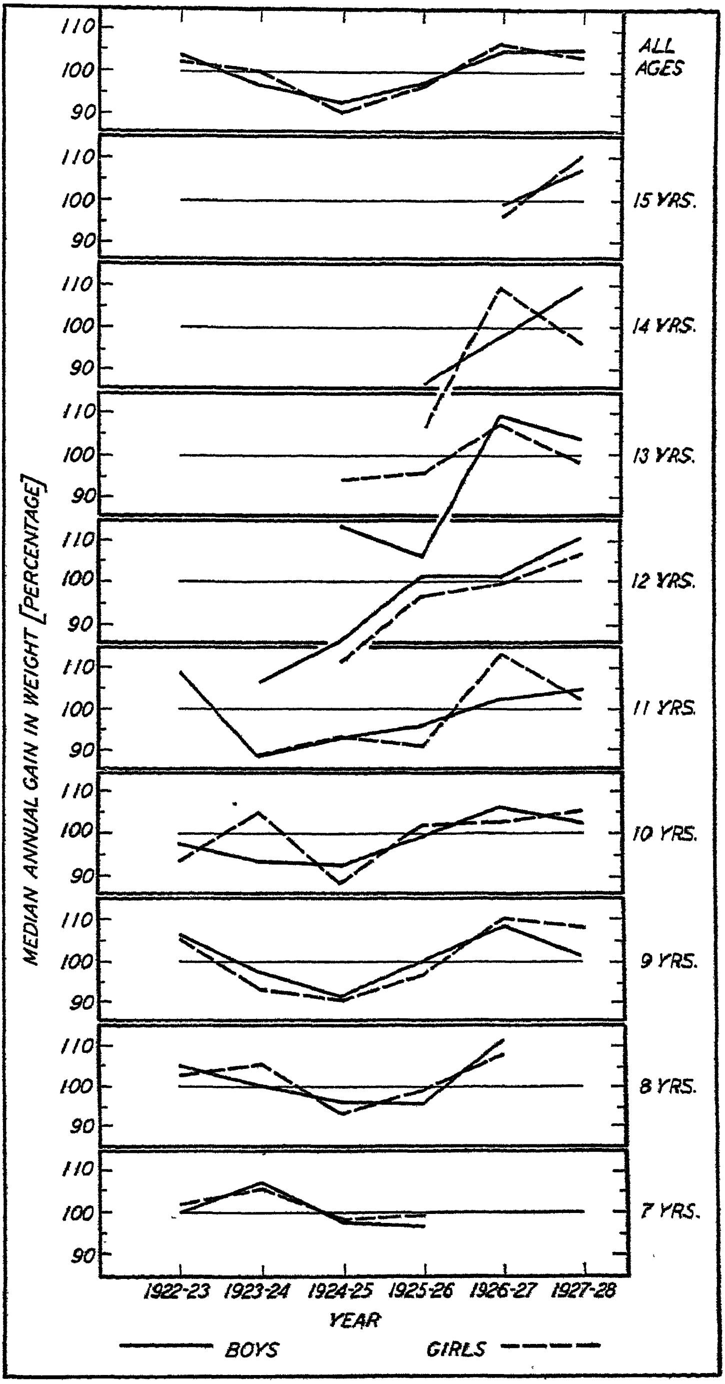

FIGURE 2.—Percentages: Median annual gains in weight in specific years of median annual gains all years combined. (White, native-born, elementary school children, Hagerstown, Md.)

1926–27, show an average difference of approximately 17 percent in median annual increments; and it is clear that the variations of gain in the several successive years must be representative of general factors which influence the growth of all of the children.

Correlation of means and standard deviations of annual gains.—Study of table 1 indicates, and a quantitative test shows, that there is a direct association between the means and standard deviations of the distributions of gains in the different years. The Pearsonian correlation coefficient [5] is for boys $+.59 \pm .13$; for girls, $+.61 \pm .15$, and for both sexes combined, $+.60 \pm .09$. These are clearly significant correlations, and show that increased growth increments are associated with increased variability of growth increments. The meaning of this correlation is not altogether clear. It is, of course, well known that both means and standard deviations of weight increments increase with age, and the statement is made frequently that increased variability is inherently associated with increased rapidity of growth. However, Nylin (8), and Palmer (7) have shown that in children of the same sex and age very great differences in mean *monthly* gains in weight are not directly associated with the variability of the gains. Acceptance of all of these findings necessarily leads to no logical contradiction, but explanations of them are at this time almost entirely conjectural.

Actual weights in successive years.—Means of the October weights for the different years, expressed as percentages of the means of distributions of "all years", are shown graphically in figure 3. With the exception of the means based on few cases, the fluctuations are small, and it is generally impossible, on the basis of samples of the sizes dealt with here, to show statistically significant differences in the average weight of children born in successive calendar years. A further analysis of these data was made by averaging the percentage deviations of groups of the same children [6] as they were followed during the 7 years of measurement. The result of the analysis gave no indication of a systematic trend, either for boys or girls, or for the two sexes together. The only suggestive finding is that girls, born within 6 months of January 1, 1915 (entering these data in the group of 6-year-old girls measured in 1921, and continuing as the group of 7-year-old girls measured in 1922, 8-year-old girls in 1923, etc.), are slightly heavier, on the average, than is usual for girls of their age. Inspection of the frequency distributions showed that the average is

[5] The variables, standard deviations, and means were expressed as percentages of the values, standard deviations and means, respectively, under the headings "All years." This method of analysis was adopted as a practical expedient for eliminating the effect of age changes on the correlation. The correlation coefficient was calculated after omitting pairs of values based upon distribution of less than 25 cases and without weighting for the number of cases upon which each pair was based.

[6] These are, of course, not exactly the same children, but they are children *born in the same year*, and those who have lived, therefore, through, identical "growing" years.

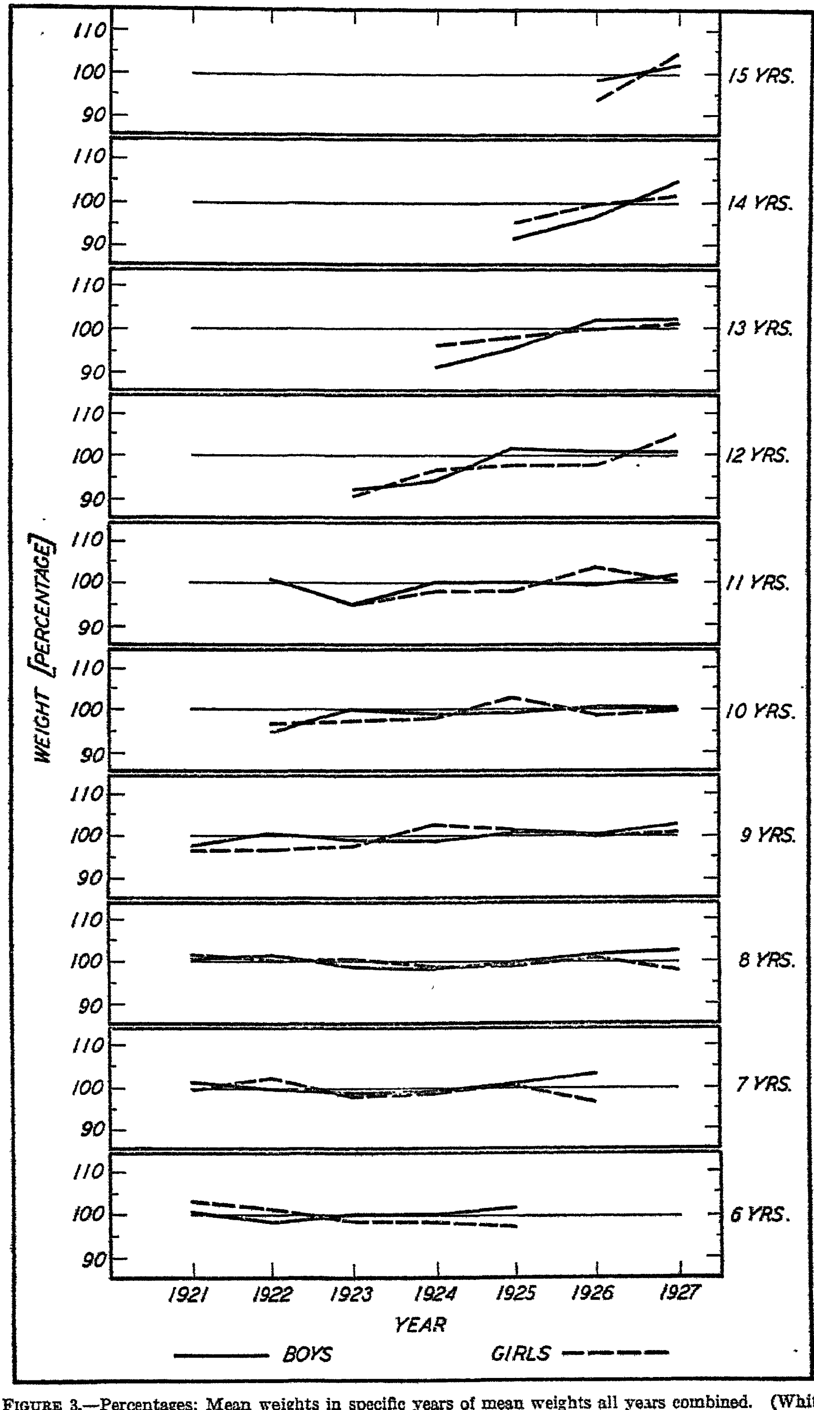

FIGURE 3.—Percentages: Mean weights in specific years of mean weights all years combined. (White, native-born, elementary school children, Hagerstown, Md.)

influenced by a small group of rather heavy individuals, and that there is no evidence of a really significant character in the finding.

The results of this part of the investigation show that when groups of children born in successive calendar years reach school age, the effects of differences of growth in different years are largely eliminated. Such a finding is, *a priori*, to be expected, if, as is shown above, there is considerable variation in the *succession* of good and poor "growing" years. Exceptions to this generalization may be expected and are clearly shown [7] in recent work on the growth of children living for a succession of years under the very unfavorable conditions which existed in central Europe during and immediately following the war.

GENERAL DISCUSSION

Analysis of the various factors which may be related to the differences of growth in the different years, although of great importance in the final interpretation of the results of the study, will not, and at the present time cannot, be made. It is reasonable to believe that a great number of intercorrelated variables are associated with the observed variation. On the side of the physical or climatological characteristics of the different years, it is conceivable that the amount of solar energy, in terms of total hours of sunshine, hours of cloudiness, amount of rainfall, average humidity, and so on, is related to the growth differences. In connection with the study of such variables it would be of interest to determine whether or not the growth of trees and plants, yields of grain and vegetable products, milk yields, egg production, and so on, show a similar fluctuation. On the side of the socio-economic characteristics of the years of observation, it is reasonable to suppose that the amount of unemployment, per capita wages of the employed, etc., might be associated with the growth trends. From the point of view of hygiene and public health, it is of importance to consider mortality rates, the incidence of epidemic diseases, fluctuations of endemic diseases, the efficiency and effectiveness of school hygiene, and similar variables. Consideration of the possible factors involved and a study of some of them have convinced the writer that the variables concerned are probably closely correlated, and that it is quite impossible on the basis of only 7 years of observation to find significant associations. In this paper it must be sufficient, therefore, to point out that statistically significant differences in annual weight increments *are* observed in children living under what may be considered normal conditions in normal years.

[7] See, for example, Wolff, G., Loc. cit.

SUMMARY

Records, collected by members of the Office of Field Investigations in Child Hygiene of the United States Public Health Service, furnish the basis for a study of the fluctuations of annual growth in weight of elementary school children during the years between 1921 and 1928. The purpose of the paper is to analyze these fluctuations and to present standard measurements with which growth in other calendar years, particularly the recent years of the economic depression, may be compared.

Analysis of the records leads to the following general conclusions:

1. With the exception of a few groups, the average weights of children of given age did not vary significantly from year to year during the 7-year period.

2. Average annual weight *increments* showed a systematic and statistically significant fluctuation during the 7-year interval. The most divergent year, May 1924 to May 1925, was found to be an inferior "growing" year, weight increments averaging approximately 92 percent of the standards based on 7 consecutive annual measurements. The best "growing" year, 1926–27, showed an average increment of over 105 percent of the 7-year standards.

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ADDITIONAL STUDIES ON THE RELATIONSHIP OF THE VIRUSES OF ROCKY MOUNTAIN SPOTTED FEVER AND SAO PAULO EXANTHEMATIC TYPHUS[1]

By GORDON E. DAVIS, *Bacteriologist*, and R. R. PARKER, *Special Expert, United States Public Health Service*

In two recent reports the writers have presented experimental evidence which indicates a close relationship between the viruses of Rocky Mountain spotted fever and exanthematic typhus of Sao Paulo: (1) Sera from guinea pigs and rabbits recovered from exanthematic typhus of Sao Paulo exhibit marked protective value against the virus of Rocky Mountain spotted fever; (2) sera from guinea pigs recovered from Rocky Mountain spotted fever exhibit similar protective value against the virus of exanthematic typhus of Sao Paulo; (3) guinea pigs recovered from Rocky Mountain spotted fever are completely resistant to the Sao Paulo virus.

Additional studies are presented as follows:

(1) The protective value of Rocky Mountain spotted fever vaccine against the virus of exanthematic fever of Sao Paulo, (2) cross-immunity tests by injecting guinea pigs recovered from exanthematic typhus of Sao Paulo with the virus of Rocky Mountain spotted fever, and (3) cross-immunity tests by injecting monkeys recovered from Rocky Mountain spotted fever with Sao Paulo virus.

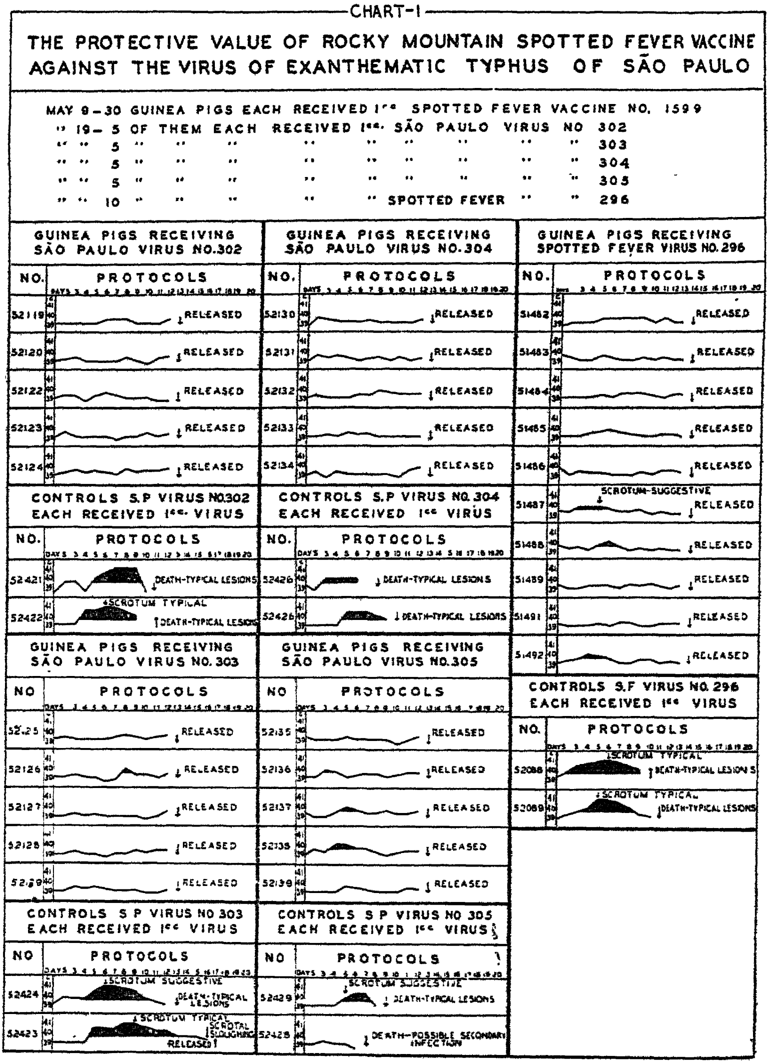
THE PROTECTIVE VALUE OF ROCKY MOUNTAIN SPOTTED FEVER VACCINE

The method followed in testing the protective value of Rocky Mountain spotted fever vaccine against the virus of exanthematic typhus of Sao Paulo was the same as is used in the routine testing of vaccine for protective properties against spotted fever. On May 9th, 30 guinea pigs each received a subcutaneous injection of 1 cc of spotted fever vaccine no. 1599. Ten days later 20 guinea pigs of this group each received an intraperitoneal injection of 1 cc of Sao Paulo virus. Five of these received virus no. 302, five virus no. 303, five virus no. 304, and five no. 305. Each lot of virus was shown to be bacteriologically sterile. The remaining 10 guinea pigs each received 1 cc of spotted fever virus no. 296. Two normal guinea pigs were used as controls on each virus.

Results (chart 1).—The five guinea pigs receiving Sao Paulo virus no. 302 remained afebrile throughout the 12 days of observation. One of the five receiving virus no. 303 and one of the five receiving virus no. 304 showed temperatures of 40° C. and 39.8° C., respectively, on the eighth day. Two of the five guinea pigs receiving virus no. 305 each showed 1 day of temperature, viz, 39.8° C. on the third day and

[1] Contribution from the Rocky Mountain Spotted Fever Laboratory of the U.S. Public Health Service at Hamilton, Mont

40° C. on the fifth day, respectively. Of the 10 guinea pigs receiving the spotted fever virus, 6 remained afebrile throughout the period of observation. Of the remaining 4, one registered a temperature of 39.8° C., on the third, fourth, and fifth days, with a slight scrotal reaction on the latter day; one, 39.8° C. and 40° C. on the fifth

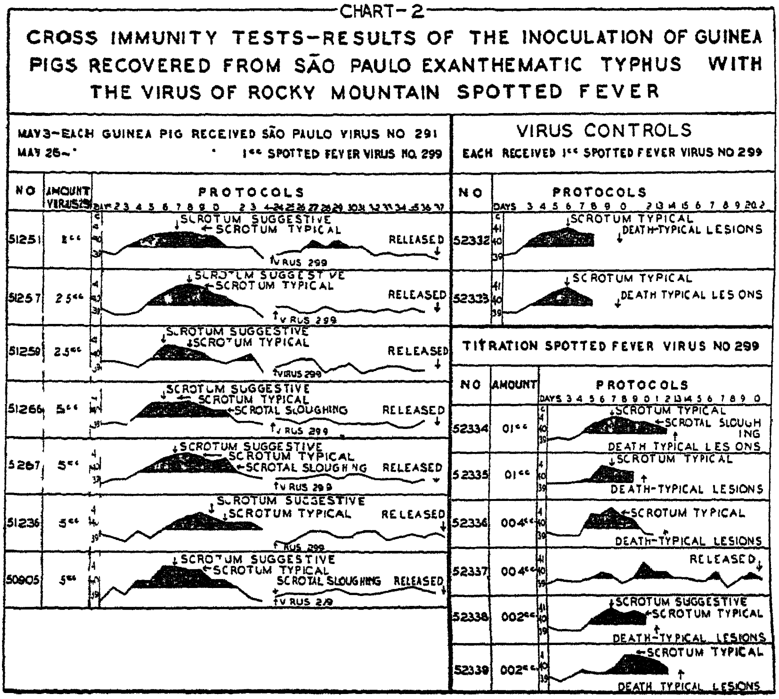


and sixth days, respectively, and one, 40° C. and 39.8° C. on the fourth and fifth days, respectively.

Virus controls.—Both control guinea pigs receiving Sao Paulo virus no. 302 died on the tenth day, showing typical lesions. One of the control guinea pigs receiving virus no. 303 died on the thirteenth day;

the other was released on the eighteenth day following a typical thermic reaction and scrotal sloughing. Control guinea pigs receiving virus no 304 died on the eighth and ninth days, respectively, and typical lesions were found at necropsy. One of the animals receiving virus no 305 died on the ninth day, showing typical lesions; the other died afebrile on the seventh day. The spleen of the latter appeared typical grossly, but it is possible that there was a secondary infection.

The two control pigs receiving spotted fever virus died on the ninth and eleventh days, respectively Both showed characteristic thermic and scrotal reactions and the lesions were typical at necropsy.

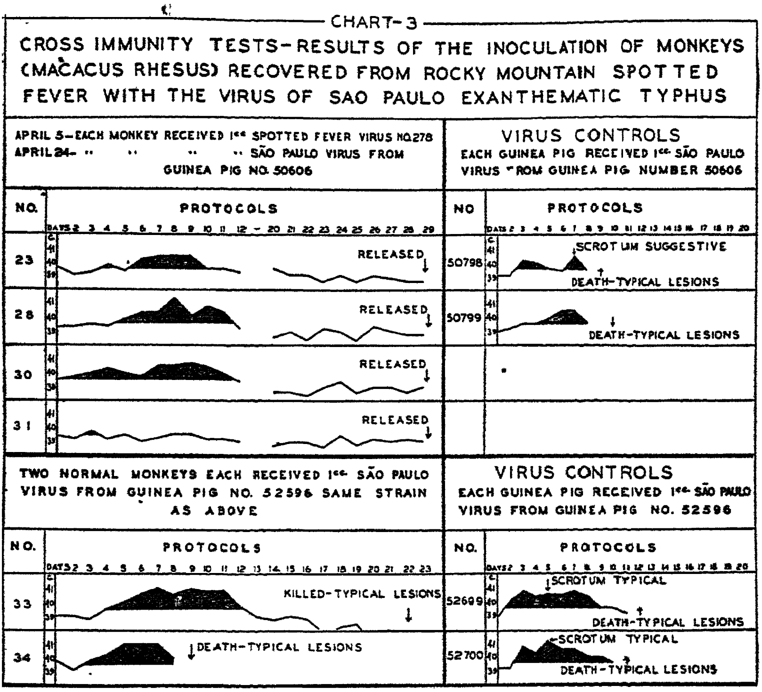


CROSS IMMUNITY TESTS

Guinea pigs.—Of a series of 18 guinea pigs injected with the virus of Sao Paulo typhus no. 291, 7 survived. One of the surviving guinea pigs had received 0.1 cc of virus, 2 had received 0.25 cc each, and the remaining 4 had each received 0.5 cc. The thermal and scrotal reactions were typical in all cases but one, and this guinea pig later showed scrotal sloughing. Twelve days following the injection of the Sao Paulo virus each guinea pig received 1 cc of spotted fever virus no. 299. Two normal guinea pigs were used as virus controls.

Results (chart 2).—On the third and fifth days one guinea pig registered a temperature of 40° C. No other guinea pig showed

fever at any time during the 13 days of observation nor was there scrotal reddening or swelling. All were released on the thirteenth day. The two spotted fever virus control guinea pigs were typical clinically; both died on the tenth day, and typical lesions of the spleen, testes and adnexa were found at necropsy. The spotted fever virus was also titrated in guinea pigs as follows: Two received 0.01 cc of virus each; two 0.004 cc each; and two 0.002 cc each. Five of these died of spotted fever. One of those which received 0.004 cc was released on the twenty-first day. It had shown irregular fever over a period of 6 days but no scrotal swelling. Such reactions are of frequent occurrence in the titration of spotted fever virus.



Monkeys (chart 3).—Four survivors of a series of monkeys (*Macacus rhesus*) which had been injected on April 5 with spotted fever virus, each received on April 24, 1 cc of Sao Paulo passage virus from guinea pig no. 50606. Following the injection of the spotted fever virus, 3 showed definite febrile periods, while in 1 the highest temperature recorded was 39.8° C. Following the injection of Sao Paulo virus none showed temperature above 39.6° C. during the observation period.

Unfortunately, normal monkeys were not available for virus controls. However, two guinea pigs which received 1 cc of this virus showed definite febrile reactions, and suspicious scrota. Both died on

the ninth day and showed typical lesions at necropsy. On June 15 two normal *rhesus* monkeys and two normal guinea pigs received an intraperitoneal injection of 1 cc each of the *same strain* of Sao Paulo virus as that used in the monkeys as above described. One monkey died on the ninth day following a pyrexial period. There was a macular purpuric rash on the face, on the arms at the elbows, on the legs and perineum. The spleen was congested. The other monkey was sacrificed when *in extremis* on the twenty-second day. Epistaxis had been present for several days. A petechial rash, which appeared first on the face and legs had become confluent. There was extensive necrosis of the fingers and toes, perineum, and alae nasi. The liver extended 5.5 cm below the costal margin. There was a marked myocardial hypertrophy and excess fluid in the pericardial cavity. The two guinea pigs used as virus controls died on the tenth and twelfth days, respectively, showing typical lesions of the Sao Paulo disease.

DISCUSSION

Our results as regards cross-immunity tests have been paralleled by Dr. J. L. Monteiro of the Instituto Butantan (personal communication) and by Dyer (1933). Our data indicative of the close relationship of the two diseases concerned furnish the added evidence of cross protection by convalescent sera and the equal degree of protection which Rocky Mountain spotted fever vaccine affords against both infections. In the latter connection Doctor Monteiro has advised that a vaccine prepared from *Amblyomma cajennense* also protects against both viruses. The essential identity of these typhus-like diseases appears to be well established.

SUMMARY

Guinea pigs which have received Rocky Mountain spotted fever vaccine are protected in equal degree against both spotted fever virus and the Sao Paulo virus.

Guinea pigs which have recovered from the Sao Paulo disease are completely resistant to spotted fever virus.

Monkeys which have recovered from spotted fever are completely resistant to Sao Paulo virus.

These results are additional evidence of the essential identity of the two viruses.

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ESTIMATION OF BASOPHILIC CELLS (RETICULOCYTES) IN BLOOD BY EXAMINATION OF ORDINARY BLOOD FILM

By R. R. JONES, *Passed Assistant Surgeon, Office of Industrial Hygiene and Sanitation, United States Public Health Service*

BRIEF REVIEW OF LITERATURE

Cunningham (1920) described a method for permanently staining reticulocytes. Key (1921) published a very interesting paper dealing with the various forms of basophilia and their relation to the normal red blood corpuscle. Seyfarth (1927) furnished an excellent bibliography, reviewed in detail much of the late work done on reticulocytes, and discussed the relationship of basophilia to other blood findings.

Brilliant cresyl blue is the stain most commonly used for supravital staining of blood preparations; but it has long been known that the basic staining substance present in young erythrocytes can be stained by any basic dye which may enter the corpuscle. As stated by Key, this substance is demonstrated either in the form of polychromatophilia, punctate basophilia, or reticular designs, depending upon the staining method used. Any stain containing a basic dye, applied after chemical fixation and before destruction of the basic staining substance, furnishes the polychromatic picture or that of punctate basophilia, or both. Vital staining applied without fixation furnishes the familiar reticulations, sometimes with more or less fragmentation of the reticulum.

If it were possible in routine practice to stain a blood film uniformly and regularly so as to show every polychromatic cell clearly differentiated from mature red blood cells, that procedure would naturally be the most convenient method of estimating the percentage of juvenile erythrocytes. While this has not, to date, proved feasible by the use of the chemically fixed film, nevertheless, films air dried and stained according to Ehrlich's proposal in 1881 do provide a picture from which it is possible to make as accurate an estimation of the percentage of young cells as by any known procedure, and with relatively less training as well as less laboratory equipment. This offers a distinct advantage, not only in research and industrial medicine, but in the field of general practice as well. The physician may, from a single blood smear made at the bedside and without special prepara-

tion, later secure an estimation of reticulocytes from the same slide which is taken for ordinary purposes (such as differential white cell counts).

Askanazy (1893) noted in preparations of blood from persons suffering from anemia the presence of certain cells showing reticulations, but failed to consider what relationship might exist between the presence of such cells and the degree of anemia. In 1895 the same author published a paper in which he discussed the significance of megaloblasts found in blood films made upon patients suffering from secondary anemia, and again noted the presence of cells showing reticulations.

Biondi (1908) is credited with publishing the first statement that cells showing polychromatophilia and those showing reticulations were the same, depending upon the method of staining. Pepper and Peet (1913) went on record as agreeing with him. The preceding year Cesaris-Demel advanced the theory that cells showing punctate basophilia and those showing reticulations were the same, but erred by further stating that polychromatophilia was of nuclear origin.

Hawes (1909), using blood from sick and well individuals, old and young, showed that the three forms of basophilia must be considered different forms of the same process. He secured a somewhat higher count of reticulocytes by the vital staining technique than polychromatic cells in the fixed preparations, but decided that the difference was due to the increased efficiency of the vital stain (cresyl blue) over that used in staining fixed preparations.

Robertson (1917) proved by a series of experiments that basophilic cells were indeed young cells, and that their incidence expressed the degree of blood regeneration going on at the time. During 1929 examinations were made by research workers of the United States Public Health Service of over 1,500 ordinary blood films taken from employees of a storage battery establishment, who were either ill with plumbism or showed evidence of lead absorption. The most constant finding upon examination of the fixed films was an increase in the percentage of polychromatic cells (both diffuse and punctate). Examination of the nonfixed films taken at the same time showed a corresponding increase in basophilic cells (classed as reticulocytes). There was also a definite correlation between the estimations of punctate polychromatic cells and of basophilic cells (reticulocytes); but the latter appeared in much greater numbers per million red blood cells.

The work of Swartz (1921), in developing the thick drop method of testing for lead absorption, was basically an application of the staining principles advocated by Ehrlich. McCord (1924), in this country, recognized the value of the test and offered a "standard" for reporting the density of the "aggregations". Seiffert (1922)

recommended staining the usual thin blood film without fixation by the same technique as staining the thick drop, but he erred in considering all basophilic cells so demonstrated as punctate basophilia ("stippled") and also in staining the whole film so that no accurate check could be made as to total number of erythrocytes furnishing a given number of basophilic cells.

Fleckel and Tschernow (1930) reported a method of classifying degree of lead absorption in individuals by expressing the ratio of the number of reticulocytes shown by vital staining to that of erythrocytes. (They considered the presence of from 0.7 to 1.0 percent of erythrocytes showing reticulations as normal.) Our experience agrees with them in most cases; however, we cannot accept in all cases the ratio of reticulocytes to total erythrocytes as a true criterion of the degree of lead absorption any more than that punctate basophilia may be so considered. Severe cases of plumbism of long duration with a marked secondary anemia may show very few basophilic cells until they are taken away from exposure, effective treatment is begun, and a start toward recovery is made. In fact, the percentage of erythrocytes staining as basophilic cells may be below normal. Böttrich (February 1932) makes this same statement regarding punctate basophilia in cases of plumbism of long standing.

Most methods devised for counting the young erythrocytes present some difficulty; and with all methods a certain amount of training and experience is required on the part of the technician to insure trustworthy results. In the hands of careful workers these methods have generally proved quite satisfactory for clinical purposes. Because of certain physical properties of these juvenile red blood cells, especially their tendency to stick to foreign substances, and their difference in weight per cell volume, the necessity for carrying out the preparation in the simplest manner is obvious. The transfer of blood from pipettes to slides may be accompanied by the loss of a significant amount of new cells.

The technique here described calls for no transfer of blood by means of pipettes, no centrifuging and separating of cells from the staining solution, no attempt to make an even film over a slide covered by dried stain—simply the spreading of an even blood film over a clean slide as for making the ordinary blood smear. This method is particularly adapted for research study because more cells are examined, assuring a greater degree of accuracy; and, also, no cells are lost through transfer of specimens or centrifuging process. Furthermore, the same slides furnish fields from which stippled cell estimations may be made. No special preparation other than the providing of proper staining fluid is necessary. The permanency of the preparation is also of distinct value, affording an opportunity for continued study or rechecking of results obtained.

BLOOD FILM TECHNIQUE

The purpose of this article is to describe a technique for the estimation of basophilic cells (reticulocytes) using the ordinary blood film instead of vitally stained preparations.

Although, in the study made by the Public Health Service workers referred to above a slightly different basic stain was used than that used by either Swartz, Seiffert, or McCord, the principle was that proposed by Ehrlich. Staining without fixation results in partial destruction of adult erythrocytes, only the immature or basophilic cells remaining. This fact made it impossible for previous workers to estimate the number of erythrocytes examined. The present technique obviates this difficulty in that fixation of one half of the film through its long dimension makes it possible to estimate the number of erythrocytes in any nonfixed portion of the film from the number found in a corresponding area of the fixed portion, as shown by the accompanying diagram (fig. 1). It is necessary to use corresponding

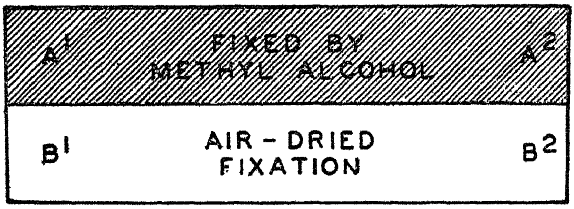

FIGURE 1.—Diagram of slide showing one half of the film area fixed.

portions of the film, because, for instance, there may be considerable difference in the distribution of cells at A^2 and A^1; but in a well made film the number of cells per unit of area at A^1 is practically the same as at B^1, and at A^2 the same as at B^2.

Before beginning the investigation of the incidence of plumbism among the group of battery workers, several of the stains commonly used to demonstrate punctate basophilia were tried out to determine which, in the hands of those doing the work, would prove the most efficient. All factors considered, the Sussmann-Weindel solution of toluidine blue, methylene blue, and borax furnished the most uniform results in examination of both fixed and nonfixed films. The formula is as follows:

Toluidine blue	0.5 gm
Borax	.05 gm
Methylene blue solution (Loeffler's)	5 cc
Distilled water	100 cc

The borax is added to the water, which is heated to dissolve if necessary. The toluidine blue is added and allowed to stand for a few minutes; occasional stirring may hasten solution. Next is added the

methylene blue. The solution is then filtered through a single no. 30 filter paper.

Films are made as for ordinary blood smears. (If care is taken to have clean slides, a little practice will insure relatively thin, even films.) The films are allowed to dry for from 5 minutes to several hours, but best results are obtained when stained not more than 3 hours after smearing. One half of the smear (as shown in fig. 1) is fixed with 95 percent methyl alcohol by placing a strip of filter paper about 1 centimeter wide over this half and saturating it with alcohol, care being taken not to drop the alcohol on too rapidly or in such amount that it will run past the paper over the other half of the slide. The paper will fall off when dry. The slide is then immersed in the staining solution (using an ordinary staining jar) and allowed to remain for from 20 to 30 minutes. After being rinsed under a cold water tap by passing through a slow stream of water three to six times, it is placed on edge and allowed to dry.

When examined under oil immersion, those cells on the half of the slide fixed with methyl alcohol have the appearance of regularly stained blood films (fig. 2); and differential leucocyte and stippled counts may be obtained and any other change in the morphology of the red blood cell noted. On the portion of the slide which received no fixation other than drying in the air, only the white cells and erythrocytes containing basic staining substance (reticulocytes) remain, the aqueous dye solution having destroyed adult erythrocytes by laking (as shown in fig 2).

As the same stain is used over and over again, its density is increased through loss of water, and the adult cells may not be completely laked. However, they show up only as outlines or what might be termed "cell shadows."

The same procedure as the above, with a solution of Manson's blue as advocated by McCord, will give quite similar results and give them more quickly (in 2 to 5 minutes). However, although the cells in the nonfixed portion may show up as well as when using toluidine blue, the fixed portion is not nearly so satisfactory for routine examinations. One must be more particular about the duration of staining, and results with this solution are likely to be less uniform. Much the same criticism may be offered concerning the use of various concentrations of methylene blue and toluidine blue. Sussmann-Weindel solution holds up very well and may be used for 3 to 6 weeks after being prepared.

No special equipment is required for estimating the number of reticulocytes per 1,000 red blood cells, but the procedure is much simplified by using the counting ocular designed by Ehrlich for determining the ratio between red and white corpuscles in stained dry mounted preparations. The ocular may be adjusted to furnish one

to four visual fields of known ratios, the ratio of the fields being 1 : 4 9 16 A no 3 field with this ocular, which has nine times the area of a no. 1 field, was found most convenient. Metal or cardboard disks, inserted in the ordinary eyepiece, may be used in lieu of the ocular, one disk with an aperture 1 millimeter square, and one with an aperture 3 millimeters square Since the fields covered are measured by use of a mechanical stage, it is necessary to know how many fields are viewed in moving the stage 1 millimeter This is found by focusing on a blood smear, setting the stage at a given point, then counting 100 fields in succession while the stage is moved laterally and noting the distance the mechanical stage has moved Several trials gave an average of 11.1 no 3 fields per millimeter.[1]

It is not difficult to get the average cell count of cells found or viewed by the use of one no 3 field For example, say the smear is of such thickness that the average number of cells per field found in 20 no. 1 fields is 10; then one no. 3 field would contain 9 times 10, or 90 cells; and going 1 millimeter on the mechanical stage would bring into view 11.1 times 90, or 999 cells.

To estimate reticulocytes, focus on the fixed half of the smear and move to the nonfixed area, note the reading on the mechanical stage, then count all the basophilic cells seen as the stage is moved laterally, and note final reading. The next step is to count the number of erythrocytes viewed in examining a corresponding area on the fixed half of the film; this count may be taken as the number of erythrocytes that are present in the portion of the nonfixed half examined for reticulocytes.[2]

COMPARATIVE RESULTS WITH ORDINARY BLOOD FILM AND VITAL STAINING TECHNIQUE

Through the cooperation afforded by the superintendent and staff of a local hospital, it was found possible to make blood examinations for the purpose of comparing the results obtained by vital staining techniques and the staining of air-dried blood film with Sussmann-Weindel staining solution. In all about 46 specimens of blood from persons suffering from some form of anemia were examined by both methods. When possible, without inconvenience to the patient, four vital stain preparations and a like number of ordinary blood films

[1] This (constant) number of fields per millimeter move of the mechanical stage needs to be determined but once for any given set-up of microscope, eyepiece, and lens

[2] For example, suppose we count 180 reticulocytes and find the stage has been moved 12 2 millimeters Then we take the average number of cells found in a no 1 field by counting 10 to 20 no 1 fields in the fixed portion of the slide corresponding to the area in which the 180 reticulocytes were found This multiplied by 9 gives the average number viewed in one no 3 field, and with 11 1 such fields to the millimeter we estimate that we have examined 12 2 times 11 1 times 9 times average no 1 field (say 10)=12187 cells, in which 180 reticulocytes were found Thus the specimen shows $\frac{180}{12187}$=1 47 percent of erythrocytes showing reticulations.

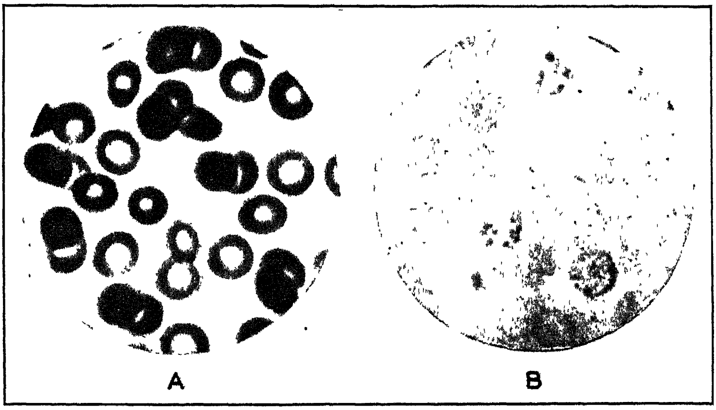

FIGURE 2.—A, Photomicrograph of fixed portion of the film; B, photomicrograph of nonfixed portion of the field (demonstrating basophilic cells).

were made from the same blood samples (34 such samples were obtained).

Like duplicate samples were obtained from 22 apparently well individuals.

The average percentage of erythrocytes showing reticulations was found to be 3.73 for all examinations by the vital staining technique and 3.78 for corresponding examinations using the air-dried blood film. For apparently normal individuals, these averages were 0.49 and 0.62, respectively. For persons showing some degree of anemia, these averages were 5.13 and 5.48, respectively. Thus it is seen that

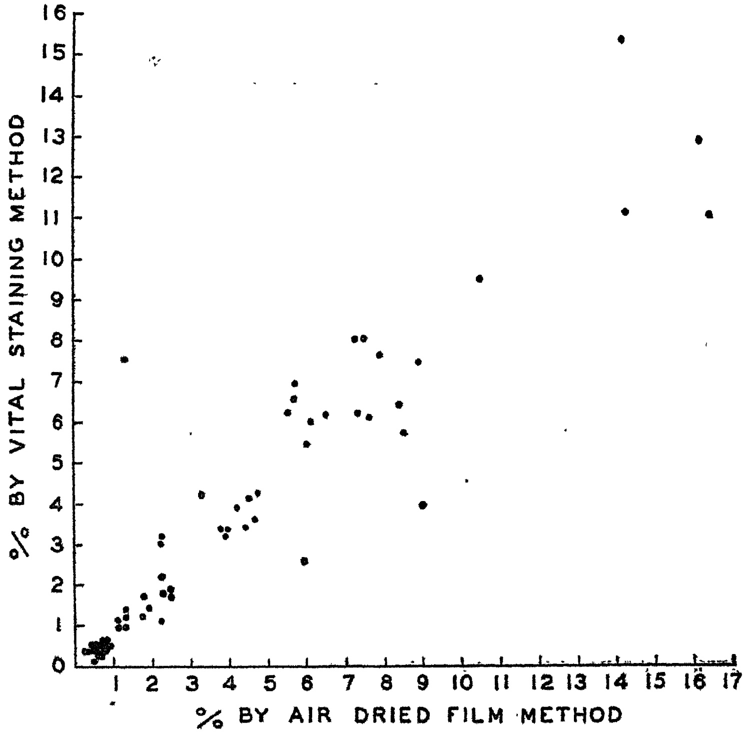

FIGURE 3.—Correlation between the results obtained in estimation of percentage of reticulocytes from vital stained preparations and air-dried films.

the ordinary blood film technique and the vital staining technique yield about the same average results.

In individuals showing high reticulocyte percentages by the vital staining method, equally high values were found with the ordinary blood film method. This fact is shown in figure 3, which indicates the correlation between the results obtained by both methods on different individuals.

This close correlation is evidence that the ordinary film method will give results equally as reliable as those obtained by the vital staining method.

With regard to the question of reliability, additional evidence is given by a comparison of the respective variabilities in successive readings made from the same specimen. Such variability may be measured approximately, for each method, by taking the deviations of individual counts from the mean for all readings made from the same specimen, averaging these deviations, and dividing the average by this mean (giving what may be termed a coefficient of variability). In table 1 is illustrated the method by which the calculation is made, for both vital staining and ordinary blood film techniques.

TABLE 1.—*Calculation of coefficient of variability*[1] *in different estimations made from the same specimen*

[Case 24. Pernicious anemia]

Estimation	Vital staining technique (cresyl blue)			Dried films (toluidine blue)		
	Percentage of red blood cells showing reticulations	Deviation from average	Coefficient of variability	Percentage of red blood cells showing reticulations	Deviation from average	Coefficient of variability
First	8.3	1.2		9.4	1.0	
Second	10.4	.9		11.1	.7	
Third	10.7	1.2		10.4	.0	
Fourth	8.7	.8		11.0	.6	
Average	9.5	1.02	10.7	10.4	.57	5.4

[1] This is not the customary coefficient, but is obtained as explained in the text.

When this procedure is applied to the whole group of persons (34) for whom four estimations by each method were made on a single specimen of blood, it was found that the average of the coefficients of variability for the vital staining technique was 24.39, while for the ordinary blood film technique it was only 8.89, indicating a greater stability in the latter case. This difference is statistically significant as indicated by table 2.

TABLE 2.—*Distribution of coefficients (average deviation from the mean divided by the mean)*

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40+
Vital staining	0	2	7	9	4	3	3	4	2
Ordinary blood film	5	15	9	5	0	0	0	0	0

All factors considered, it would seem that the greater stability of results obtained by the ordinary film method is accounted for by the fact that the vital staining technique ordinarily calls for the actual examination of from 500 to 1,000 erythrocytes, while by ordinary blood film method from 7,000 to 12,000 cells are usually viewed.

No effort should be made to distinguish between stippled and reticulated cells in the nonfixed portion of the slide (both being young erythrocytes). If it is desired to secure the stippled cell count, the same should be made upon the fixed portion of the film. If convenient, several blood films should be prepared at the same time, especially until one's technique is so developed that thin, evenly spread films are regularly prepared.

By exercising care and attention upon the task of determining the proper "constant" for the microscopic set-up being used, the calculations are simplified and more uniform. At first glance the technique may seem rather complex; but once the "constant" is determined, the calculations are easily completed.

SUMMARY

1. A simple method of estimating juvenile red blood cells (basophilic cells or reticulocytes) from ordinary blood films is described.

2. The preparation may be made and examined at the convenience of the technician, and is relatively permanent, so that re-checks may be made by the same technician or by others interested.

3. It is possible to use the same slide for estimation of reticulocytes; differential white blood count; platelet estimation; and study of red blood cells for polychromatophilia, achromasia, anisocytosis, poikilocytosis, and punctate basophilia.

4. A report is made to the effect that this technique was used in examining blood films taken from persons exposed to lead and that most of such examinations showed an increase in the total number of reticulocytes.

5. Comparison of the vital staining and ordinary blood film techniques shows—

(a) The average percentage of erythrocytes with reticulations was about the same by both methods.

(b) There was a high degree of correlation in the results taken individually.

(c) There was less variability in the results obtained by the ordinary blood film technique than by vital staining.

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COURT DECISION RELATING TO PUBLIC HEALTH

Abatement of public nuisance by local board of health.—(California Supreme Court; *Eaton et al.* v. *Klimm et al.*, 18 P. (2d) 678; decided Jan. 31, 1933.) The plaintiffs were partners in a general contracting business for street improvement work and sought to enjoin the board of health of the city and county of San Francisco from carrying into effect a resolution of the said board declaring the structures occupied by the plaintiffs to be a nuisance and ordering that the said structures be vacated and demolished, and also to enjoin the chief of police from taking summary action based on failure to comply with the order. The plaintiffs' premises comprised, among other things, a two-story frame structure used as an asphalt mixing plant and a series of nondescript one-story woodsheds used as places of storage. The trial court denied an injunction and the plaintiffs appealed to the supreme court.

The appellate court held that the operation of the asphalt mixing plant constituted a public nuisance and that a right to maintain such a nuisance could not be gained by prescription. Relative to the fact that, by the zoning ordinance which zoned the district as a light

industrial district, the plaintiffs were permitted to continue the operation of their plant, the court said that this was not an absolute defense to nuisance proceedings, and quoted from a district court of appeal decision that "It has been held a number of times in this court that a license, permit, or franchise does not authorize the creation or maintenance of a nuisance."

The court took the view that the nuisance was caused by the operation of the asphalt mixing plant and was not even remotely connected with the sanitary condition of the buildings upon the premises. It also reached the conclusion that the ordinance under which the board acted covered only those situations in which the buildings themselves, or any part thereof, were insanitary. This being so, it was held that the remedy provided and penalty prescribed by the ordinance were inapplicable to the instant situation.

The court said, however, that it did not follow that the plaintiffs were entitled to the injunction which they sought restraining the board from "taking possession of or removing or, in any manner, whatever, interfering with any of the property hereinabove described or with the business of plaintiffs conducted thereon, or with plaintiffs' operation of said business upon said property." The case of *McQueen* v. *Phelan*, 4 Cal. App. 695, 88 P. 1099, 1100, was cited, wherein it was held that, inasmuch as under section 3494 of the civil code "a public nuisance may be abated by any public body or officer authorized thereto by law", public officials could not be restrained by injunction from proceeding, according to law, to abate what is found to be a public nuisance, whether the ordinance under which they purported to act was valid or void. "In the instant case", said the court, "the issue of whether or not the operation of appellants' business constituted a nuisance was presented by the pleadings, and the court expressly found that the conditions complained of were true and that the operation of the plant constituted a nuisance. It follows that the board of health, under section 3494 of the civil code, is entitled to abate the operation of said asphalt mixing plant, and the trial court properly refused to grant an injunction restraining the board of health from interfering *in any manner, whatever*, with the appellants' business."

The court held, however, that the plaintiffs—

were entitled to an injunction restraining the carrying into effect of the drastic order issued by the board of health under the purported authority of ordinance no. 501 (new series); that is to say, the demolishing of the buildings and the removal of appellants' equipment. Appellants are also entitled to an injunction against the attempted enforcement of said order by the infliction of the penalty specified in ordinance no. 816 (new series) for a failure to comply with said orders.

The judgment was reversed and the cause remanded to the trial court with directions to issue an injunction in accordance with the conclusions expressed in the opinion.

DEATHS DURING WEEK ENDED JULY 29, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended July 29, 1933	Corresponding week, 1932
Data from 85 large cities of the United States:		
Total deaths	7,162	6,632
Deaths per 1,000 population, annual basis	10.0	9.5
Deaths under 1 year of age	481	521
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	41	44
Deaths per 1,000 population, annual basis, first 30 weeks of year	11.3	11.7
Data from industrial insurance companies:		
Policies in force	67,700,024	71,641,157
Number of death claims	12,065	13,014
Death claims per 1,000 policies in force, annual rate	9.3	9.5
Death claims per 1,000 policies, first 30 weeks of year, annual rate	10.2	10.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended August 5, 1933, and August 6, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Aug. 5, 1933, and Aug. 6, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 5, 1933	Week ended Aug 6, 1932	Week ended Aug. 5, 1933	Week ended Aug. 6, 1932	Week ended Aug 5, 1933	Week ended Aug 6, 1932	Week ended Aug. 5, 1933	Week ended Aug. 6, 1932
New England States:								
Maine	2	2			1	4	0	0
New Hampshire					8	2	0	0
Vermont					8	19	0	0
Massachusetts	16	37			83	88	1	0
Rhode Island	2	1				3	1	0
Connecticut	3	4	4		25	26	0	1
Middle Atlantic States:								
New York	31	49	[1] 1	[1] 3	186	311	3	2
New Jersey [2]	7	13		3	34	94	2	2
Pennsylvania	42	34			195	194	4	7
East North Central States.								
Ohio	15	24	3	4	28	67	1	0
Indiana	5	23	20	7	13	12	2	5
Illinois [2]	17	31	6	4	34	24	4	2
Michigan	20	7			33	214	2	1
Wisconsin	5	38	21	8	42	45	0	3
West North Central States.								
Minnesota	4	2	1		9	5	1	1
Iowa [3]	7	11			1	4	1	1
Missouri	4	4	1	1	13	6	0	1
North Dakota	2	4	5		27	16	1	0
South Dakota	3	3					0	0
Nebraska	2	2				4	0	3
Kansas	3	6			3	17	0	0
South Atlantic States:								
Delaware							0	1
Maryland [3 4]	1	6	2	4	10	7	0	1
District of Columbia	8	1			2		1	0
Virginia [2 4]	13	36			26	22	0	1
West Virginia	10	8	10		33	34	2	0
North Carolina [2 4]	18	21	1	28	43	26	0	1
South Carolina [2]	4	7	62	49	32	16	0	0
Georgia [2]	28	18		11	24	3	0	1
Florida [2]	9	11		2	11	2	0	0
East South Central States:								
Kentucky	6				5		0	5
Tennessee	15	6	6	13	30		0	0
Alabama [2]	21	14	7	6	14		0	1
Mississippi [3]	17	19					0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Aug. 5, 1933, and Aug. 6, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 5, 1933	Week ended Aug. 6, 1932	Week ended Aug. 5, 1933	Week ended Aug. 6, 1932	Week ended Aug. 5, 1933	Week ended Aug. 6, 1932	Week ended Aug. 5, 1933	Week ended Aug. 6, 1932
West South Central States.								
Arkansas	8	2			19	1	0	0
Louisiana [2]	5	15	6		6	3	1	0
Oklahoma [5]	11	30	5	3	4	3	0	0
Texas [2]	55	46	99	16	148	13	2	1
Mountain States:								
Montana [4]	1	1			2	32	0	1
Idaho [4]		2	4		4		0	0
Wyoming [4]	1				5	3	0	0
Colorado	2	7			4	7	0	0
New Mexico	3	8			14	2	0	0
Arizona	4	2				1	1	0
Utah [3]			1	1	24	2	0	0
Pacific States:								
Washington		3		2	19	14	1	1
Oregon		2	6	11	27	13	0	0
California	25	40	9	119	106	35	0	1
Total	455	600	280	295	1,355	1,394	31	44

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug. 5, 1933	Week ended Aug. 6, 1932	Week ended Aug. 5, 1933	Week ended Aug. 6, 1932	Week ended Aug. 5, 1933	Week ended Aug. 6, 1932	Week ended Aug. 5, 1933	Week ended Aug. 6, 1932
New England States:								
Maine	1	1	4	3	0	0	0	2
New Hampshire	0	1	6	3	0	0	0	1
Vermont	0	0	1	4	0	0	0	0
Massachusetts	20	2	58	60	0	0	10	6
Rhode Island	1	2	12	6	0	0	0	1
Connecticut	0	0	13	9	0	0	3	2
Middle Atlantic States:								
New York	73	12	100	157	0	2	40	54
New Jersey [2]	4	7	30	44	0	0	12	0
Pennsylvania	4	17	106	99	0	0	35	34
East North Central States:								
Ohio	4	2	110	64	3	4	58	44
Indiana	1	0	11	32	1	1	24	20
Illinois	7	10	74	48	2	1	28	44
Michigan	3	7	59	78	2	0	16	17
Wisconsin	0	1	17	8	2	1	8	6
West North Central States:								
Minnesota	4	6	10	13	0	1	2	8
Iowa [3]	1	2	8	6	2	8	8	17
Missouri	4	1	16	28	0	1	32	28
North Dakota	1	2	1	1	0	4	0	3
South Dakota	1	0	2	4	0	0	2	0
Nebraska	0	0	3	9	0	0	0	2
Kansas	5	3	17	18	0	0	15	9
South Atlantic States:								
Delaware	0	0		2	0	0	3	1
Maryland [3, 4]	3	3	14	25	0	0	34	41
District of Columbia	0	0	7	2	0	0	2	0
Virginia [2, 4]	0	2	13	11	0	0	38	52
West Virginia	3	0	28	4	0	0	53	45
North Carolina [2, 4]	0	0	24	15	0	0	24	45
South Carolina [2]	1	5	4	4	0	0	36	50
Georgia [2]	0	2	10	4	5	0	45	87
Florida [2]	0	0	1	3	0	1	2	0
East South Central States:								
Kentucky	0	1	12	17	1	0	83	127
Tennessee	14	0	18	7	0	0	95	111
Alabama [2]	0	3	10	8	0	0	36	33
Mississippi [2]	0	0	9	7	0	0	23	31

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Aug. 5, 1933, and Aug. 6, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug. 5, 1933	Week ended Aug. 6, 1932	Week ended Aug. 5, 1933	Week ended Aug. 6, 1932	Week ended Aug. 5, 1933	Week ended Aug. 6, 1932	Week ended Aug. 5, 1933	Week ended Aug. 6, 1932
West South Central States:								
Arkansas	0	0	1	5	0	1	25	13
Louisiana [2]	2	2	7	5	0	1	53	27
Oklahoma [5]	0	0	7	4	0	7	22	66
Texas [2]	3	2	25	17	3	1	55	43
Mountain States:								
Montana [4]	0	0	2	8	0	4	4	2
Idaho [4]	0	0	4	1	1	5	2	2
Wyoming [4]	2	0	1	1	0	0	5	0
Colorado	0	0	2	6	6	2	4	10
New Mexico	0	0	3	-------	3	0	5	6
Arizona	0	0	3	-------	1	0	3	0
Utah [3]	0	0	3	2	0	0	2	0
Pacific States:								
Washington	1	0	7	8	5	6	4	4
Oregon	1	1	10	11	4	2	3	3
California	5	4	54	35	16	3	5	9
	169	101	937	906	57	56	954	1,119

[1] New York City only.
[2] Typhus fever, week ended Aug. 5, 1933, 73 cases, as follows: New Jersey, 1; Illinois, 1; Virginia, 2; North Carolina, 6; South Carolina, 1; Georgia, 18; Florida, 2; Alabama, 18; Louisiana, 1; Texas, 23.
[3] Week ended earlier than Saturday.
[4] Rocky Mountain spotted fever, week ended Aug. 5, 1933, 15 cases, as follows: Maryland, 3; Virginia, 5; North Carolina, 4; Montana, 1; Idaho, 1; Wyoming, 1.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
May 1933										
Hawaii Territory	1	8	8	-------	-------	-------	0	1	0	8
New Hampshire	-------	1	-------	-------	-------	-------	0	92	0	2
June 1933										
Georgia	1	37	114	341	679	74	0	17	0	194
July 1933										
Arkansas	1	16	7	277	198	244	-------	12	1	104
Connecticut	2	21	11	-------	177	-------	6	76	0	9
District of Columbia	1	10	3	-------	58	-------	2	17	0	4
Iowa	4	21	-------	1	29	-------	1	42	11	5
Nebraska	2	16	-------	-------	81	-------	0	39	8	4
New Hampshire	-------	2	-------	-------	-------	-------	0	41	0	2
North Dakota	2	9	-------	-------	15	-------	7	5	3	2
Pennsylvania	17	129	-------	-------	1,284	1	19	664	0	69
Wyoming	-------	3	-------	-------	13	-------	1	17	1	5

May 1933

	Cases
Hawaii Territory:	
Chicken pox	84
Conjunctivitis, acute epidemic	6
Conjunctivitis, follicular	12
Hookworm disease	24
Impetigo contagiosa	1
Leprosy	1
Mumps	43
Septic sore throat	1
Tetanus	4
Trachoma	2
Whooping cough	339

June 1933

	Cases
Georgia:	
Chicken pox	27
Dysentery	84
Hookworm disease	131
Mumps	51
Paratyphoid fever	3
Septic sore throat	30
Tetanus	3
Trachoma	4
Tularaemia	2
Typhus fever	48
Undulant fever	7
Whooping cough	350

July 1933

	Cases
Actinomycosis:	
Pennsylvania	1
Anthrax	
Arkansas	1
Chicken pox:	
Arkansas	4
Connecticut	193
District of Columbia	14
Iowa	20
Nebraska	23
North Dakota	19
Pennsylvania	615
Wyoming	9
Dysentery	
Pennsylvania	2
German measles:	
Connecticut	6
Pennsylvania	18
Hookworm disease:	
Connecticut	1
Impetigo contagiosa:	
Iowa	1
Lethargic encephalitis:	
Pennsylvania	6
Mumps	
Arkansas	5
Connecticut	78
Iowa	46
Nebraska	12
North Dakota	2
Pennsylvania	309
Wyoming	1
Ophthalmia neonatorum:	
Iowa	1
Pennsylvania	16
Paratyphoid fever:	
Connecticut	2
Puerperal septicemia:	
Pennsylvania	6
Rabies in animals:	
Connecticut	18
Rocky Mountain spotted fever:	
District of Columbia	3
Iowa	2
Wyoming	20
Septic sore throat:	
Connecticut	4
Tetanus.	
Pennsylvania	7
Trachoma	
Arkansas	2
Pennsylvania	1
Trench mouth:	
Wyoming	2
Tularaemia:	
Arkansas	1
Wyoming	12
Undulant fever:	
Arkansas	1
Iowa	23
Pennsylvania	7
Whooping cough:	
Arkansas	55
Connecticut	175
District of Columbia	31
Iowa	192
Nebraska	117
North Dakota	82
Pennsylvania	1,323
Wyoming	14

WEEKLY REPORTS FROM CITIES

City reports for week ended July 29, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0		0	1	1	0	0	1	2	4	
New Hampshire:											
Concord	0		0	0	4	0	0	0	0	0	16
Nashua	0		0	0	0	0	0	0	0	0	
Vermont:											
Barre	0		0	3	0	0	0	1	0	0	2
Burlington	0		0	0	0	0	0	0	0	0	11
Massachusetts:											
Boston	5		0	51	0	21	0	9	0	66	167
Fall River	0		0	3	0	2	0	1	0	8	28
Springfield	0		0	0	2	1	0	0	1	4	21
Worcester	1		0	13	1	5	0	0	3	3	33
Rhode Island:											
Pawtucket	0		0	0	0	0	0	0	0	0	9
Providence	0		0	0	0	5	0	2	0	43	56
Connecticut:											
Bridgeport	0		0	3	2	1	0	5	0	2	33
Hartford											
New Haven	2		0	0	1	0	0	0	1	1	28
New York:											
Buffalo	1		0	16	13	11	0	10	0	56	123
New York	26	1	2	82	76	22	0	87	17	135	1,231
Rochester	0		0	1	11	2	0	2	1	14	70
Syracuse	0		0	0	2	0	0	0	0	8	42
New Jersey:											
Camden	0		0	0	3	0	0	1	0	0	29
Newark	0	2	0	5	5	4	0	9	0	51	93
Trenton	0		0	6	3	2	0	1	2	1	33
Pennsylvania:											
Philadelphia	4	2	0	80	5	14	0	28	6	15	397
Pittsburgh	4		1	0	9	12	0	4	0	68	120
Reading	0		0	0	1	0	0	2	0	8	21
Ohio:											
Cincinnati	0	1	0	0	7	10	0	7	0	20	131
Cleveland	3	16	0	0	4	9	0	10	5	50	174
Columbus	0		0	0	3	2	0	4	2	0	88
Toledo	2		0	6	4	18	0	4	3	28	83

City reports for week ended July 29, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Indiana:											
Fort Wayne	1	------	0	0	0	0	0	2	0	0	25
Indianapolis	0	------	0	3	8	1	0	5	1	8	------
South Bend	0	------	0	1	0	0	0	0	2	0	13
Terre Haute	0	------	0	0	0	0	0	0	0	2	24
Illinois:											
Chicago	4	1	2	27	19	37	0	46	3	76	638
Springfield	1	------	0	0	0	0	0	0	0	1	------
Michigan:											
Detroit	11	2	0	9	1	13	0	27	3	128	216
Flint	1	------	0	2	0	6	0	0	0	7	21
Grand Rapids	0	------	0	0	1	1	0	1	0	3	27
Wisconsin:											
Kenosha	0	------	0	1	0	0	0	0	0	7	6
Madison	0	------	------	0	------	0	0	------	0	11	------
Milwaukee	0	1	1	2	0	7	0	2	0	204	81
Racine	1	------	0	0	1	2	0	0	0	29	16
Superior	0	------	0	0	0	0	0	0	0	12	6
Minnesota:											
Duluth	0	------	0	9	0	2	0	0	0	13	12
Minneapolis	3	------	0	1	0	5	0	1	0	10	91
St. Paul	0	------	0	1	3	1	0	2	0	53	58
Iowa:											
Des Moines	4	------	------	0	------	2	0	------	0	0	------
Sioux City	0	------	------	0	------	0	0	------	0	6	1
Waterloo	------	------	------	------	------	------	------	------	------	------	------
Missouri:											
Kansas City	2	------	0	0	10	4	0	5	2	16	89
St. Joseph	0	------	0	------	2	1	0	0	0	0	23
St. Louis	13	------	------	19	3	2	0	12	6	19	209
North Dakota:											
Fargo	0	------	0	0	0	0	0	0	0	0	4
Grand Forks	0	------	0	0	0	0	0	0	0	0	------
South Dakota:											
Aberdeen	0	------	0	0	0	0	0	0	0	0	------
Sioux Falls	0	------	0	0	0	0	0	0	0	0	5
Nebraska:											
Omaha	------	------	------	------	------	------	------	------	------	------	------
Kansas:											
Topeka	0	------	0	0	0	2	0	0	0	3	18
Wichita	0	------	0	1	0	0	0	0	0	9	------
Delaware:											
Wilmington	0	------	0	0	1	0	0	3	0	1	31
Maryland:											
Baltimore	1	1	0	4	7	13	0	20	1	62	190
Cumberland	0	------	0	2	0	1	0	0	0	0	5
Frederick	0	------	0	0	0	0	0	0	0	0	2
District of Columbia:											
Washington	2	1	1	4	7	3	0	18	4	8	156
Virginia:											
Lynchburg	0	------	0	7	0	0	0	0	0	14	12
Norfolk	1	------	0	0	0	0	0	2	5	0	19
Richmond	0	------	0	0	1	1	0	3	2	10	39
Roanoke	1	------	0	0	1	1	0	0	4	1	14
West Virginia:											
Charleston	0	------	0	0	0	1	0	0	0	2	14
Huntington	0	------	0	0	0	0	0	0	0	0	------
Wheeling	0	------	0	0	0	0	0	0	0	1	15
North Carolina:											
Raleigh	0	------	0	0	0	0	0	1	1	0	18
Wilmington	0	------	0	1	0	1	0	1	0	0	10
Winston-Salem	1	------	0	4	2	3	0	2	0	1	18
South Carolina:											
Charleston	0	2	0	0	1	0	0	0	1	1	18
Columbia	------	------	------	------	------	------	------	------	------	------	------
Greenville	0	------	0	0	0	0	0	0	2	0	7
Georgia:											
Atlanta	6	7	0	0	2	2	0	4	11	13	76
Brunswick	0	------	0	0	0	0	0	0	0	0	6
Savannah	------	------	------	------	------	------	------	------	------	------	------
Florida:											
Miami	0	1	0	0	0	0	0	0	0	2	22
Tampa	1	------	0	0	1	0	0	2	2	1	24
Kentucky:											
Ashland	0	------	0	0	0	0	0	0	7	7	------
Lexington	0	------	0	2	0	0	0	2	8	0	20
Louisville	0	------	0	0	5	4	0	2	3	3	69
Tennessee:											
Memphis	1	------	0	9	1	2	0	20	5	10	108
Nashville	0	------	0	0	2	0	0	0	3	9	49

City reports for week ended July 29, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Alabama:											
Birmingham	1	1	0	0	3	3	0	1	9	2	40
Mobile	1	--	0	0	0	0	0	1	0	0	12
Montgomery	2	--	--	0	--	0	0	--	0	0	--
Arkansas:											
Fort Smith	0	--	0	0	0	0	0	0	0	0	--
Little Rock	0	--	0	1	2	0	0	3	0	0	5
Louisiana:											
New Orleans	2	1	1	0	4	0	0	14	5	1	126
Shreveport	0	--	0	0	2	2	0	0	1	0	9
Oklahoma:											
Oklahoma City	2	--	0	0	4	1	0	3	0	6	45
Tulsa	0	--	--	2	--	1	2	--	2	0	--
Texas:											
Dallas	6	--	0	1	0	1	0	0	4	5	44
Fort Worth	1	--	0	0	0	0	0	3	0	0	35
Galveston	0	--	0	0	1	0	0	2	0	0	13
Houston	--	--	--	--	--	--	--	--	--	--	--
San Antonio	3	--	2	0	4	2	0	5	0	1	58
Montana:											
Billings	0	--	0	0	0	0	0	0	1	1	6
Great Falls	0	--	0	0	2	0	0	0	0	5	11
Helena	0	--	0	0	0	0	0	0	0	0	2
Missoula	0	--	0	0	0	0	0	0	0	0	7
Idaho:											
Boise	0	--	0	0	0	0	0	0	1	5	10
Colorado:											
Denver	1	--	1	4	3	2	0	4	1	11	61
Pueblo	0	--	0	0	1	0	0	1	0	2	11
New Mexico:											
Albuquerque	0	--	0	0	1	0	0	3	0	5	15
Utah:											
Salt Lake City	1	--	0	20	1	0	0	0	0	11	42
Nevada:											
Reno	0	--	0	0	0	0	0	0	0	0	4
Washington:											
Seattle	0	--	--	1	--	1	0	--	0	22	--
Spokane	0	--	--	0	--	1	0	--	0	0	--
Tacoma	0	--	0	0	1	1	0	2	0	7	28
Oregon:											
Portland	1	--	0	3	2	1	2	0	0	2	70
Salem	0	--	--	0	0	0	0	0	0	0	--
California:											
Los Angeles	13	15	1	32	7	19	1	24	4	88	269
Sacramento	0	--	0	0	0	1	0	1	0	10	32
San Francisco	1	--	0	2	4	2	0	10	0	17	144

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts:			
Boston	0	0	16
New York:			
New York	7	3	40
Pennsylvania:			
Pittsburgh	0	0	2
Ohio:			
Cleveland	0	0	1
Indiana:			
Indianapolis	1	0	1
Illinois:			
Chicago	1	0	4
Michigan:			
Detroit	1	0	2
Flint	0	0	1
Minnesota:			
Minneapolis	0	0	2
Iowa:			
Des Moines	1	0	0
Sioux City	1	1	1
Missouri:			
Kansas City	0	1	0
St. Louis	0	0	1
North Dakota:			
Fargo	1	0	3
Maryland:			
Cumberland	0	0	1
Virginia:			
Richmond	0	0	1
West Virginia:			
Wheeling	0	0	1
Florida:			
Tampa	0	0	2
Kentucky:			
Louisville	1	1	0
Tennessee:			
Memphis	0	0	1
Oklahoma:			
Tulsa	5	0	0
California:			
Los Angeles	2	2	0

Lethargic encephalitis.—Cases: New York, 1; Birmingham, 1.

Pellagra.—Cases: Chicago, 2; Wilmington, N.C., 1; Atlanta, 1; Louisville, 2; Memphis, 4; Birmingham, 1; New Orleans, 1; Dallas, 1; Los Angeles, 1.

Typhus fever.—Cases: Newark, N.J., 1; Wilmington, N.C., 2; Charleston, S.C., 4; Tampa, 1; Montgomery 1; San Antonio, 1.

Rabies (in man).—Nashville, 1 death.

FOREIGN AND INSULAR

CANADA

Quebec Province—Communicable diseases—Two weeks ended July 29, 1933.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended July 29, 1933, as follows:

Disease	Cases	Disease	Cases
Chicken pox	58	Poliomyelitis	4
Diphtheria	28	Puerperal septicemia	1
Erysipelas	4	Scarlet fever	34
German measles	1	Tuberculosis	132
Influenza	1	Typhoid fever	46
Measles	278	Whooping cough	176

CHILE

Typhus fever.—According to information dated August 8, 1933, 2,530 cases of typhus fever, with 521 deaths, had been reported in Chile from January 1 to July 29, 1933. An intensive campaign was being waged against the disease.

CZECHOSLOVAKIA

Communicable diseases—May 1933.—During the month of May 1933, certain communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	1		Paratyphoid fever	14	
Cerebrospinal meningitis	20	8	Poliomyelitis	9	1
Chicken pox	410		Puerperal fever	42	20
Diphtheria	2,163	109	Scarlet fever	2,153	23
Dysentery	3		Trachoma	150	
Influenza	29	3	Typhoid fever	337	26
Lethargic encephalitis	1	1	Typhus fever	31	4

MEXICO

Vera Cruz—Vital statistics—Year 1932.—During the year 1932, births and deaths were reported in the city of Vera Cruz, Mexico, as follows:

Population, estimated	74,741	Death rate per 1,000 population	26.69
Number of live births	1,776	Infant mortality per 1,000 births	171.17
Birth rate per 1,000 population	23.76	Number of stillbirths	187
Number of deaths	1,995		

Deaths from certain diseases were reported in Vera Cruz during 1932 as follows:

Disease	Number of deaths	Death rate per 10,000 population	Disease	Number of deaths	Death rate per 10,000 population
Dysentery	27	3.61	Tuberculosis	229	30.63
Gastro-intestinal diseases	528	70.64	Typhoid and paratyphoid fever	24	3.21
Malaria	74	9.90	Uncinariasis	51	6.82

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for July 28, 1933, pp. 896–906. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Aug. 25, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

India—Bombay.—During the week ended July 15, 1933, 2 cases of cholera with 1 death were reported in Bombay.

Philippine Islands.—During the week ended August 5, 1933, cholera was reported in parts of the Philippine Islands as follows: Province of Bohol, Tagbilaran, 1 case; Province of Cebu, Opon, 4 cases, 5 deaths.

Plague

Argentina—El Mollar.—During the month of July 1933, 7 cases of plague with 3 deaths were reported in El Mollar, Salta Province, Argentina.

France—Marseille.—Under date of August 8, 1933, 2 cases of plague with 2 deaths were reported in Marseille, France.

Iraq—Basra.—During the week ended July 1, 1933, 3 cases of plague were reported in Basra, Iraq.

Typhus Fever

Egypt—Damietta.—During the week ended July 15, 1933, 2 cases of typhus fever were reported in Damietta, Egypt.

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Deaths in Large Cities During the Week Ended August 5
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

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They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of public health.

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MALARIAL FEVER IN NARCOTIC ADDICTS: ITS POSSIBLE TRANSMISSION BY THE HYPODERMIC SYRINGE

By G. H. Faget, *Passed Assistant Surgeon, United States Public Health Service, United States marine hospital New Orleans, La.*

An unusual prevalence of malarial fever in the narcotic addicts who were patients at the United States marine hospital at New Orleans was noted during the winter 1932-33. The reason for the special predilection of malaria for narcotic addicts was not known at that time, but the possible relationship of the intravenous administration of the "drug" to the disease was commented upon.

During the fiscal year ended June 30, 1933, 17 narcotic addicts were treated in this hospital. Five of them had acute cases of malaria, the diagnosis being confirmed by the finding of the plasmodia in the blood smears. This meant that 29.4 percent of the narcotic addicts seeking treatment had active malaria. During the same period there were 25 cases of malaria among 4,880 other admissions, an incidence of, roughly, one half of 1 percent. This difference was so striking that it suggested a special epidemiology for malaria in addicts. In an unpublished note to the Surgeon General of the Public Health Service, dated March 14, 1932, Dr. J. C. Geiger (1) mentioned the probable transmission of malarial infection from one addict to another by means of the hypodermic syringe. In a recent issue of the Journal of the American Medical Association, Dr. Oliver C. Nickum (2) reported a similar occurrence in Omaha, Nebr. Such an explanation would account for the unusual prevalence of unseasonable malaria in the narcotic addicts at the New Orleans Marine Hospital. In order to test this solution of the problem, our narcotic addict patients were confidentially interviewed.

During the late fall and early winter there had occurred in New Orleans an unusual number of deaths among drug addicts. This was a fact well known to all the addicts questioned, who had known several or all of the victims personally. The deaths had all occurred within a few weeks of each other; and, since two of them were peddlers, it seemed unreasonable to blame the "drug" for these

fatalities. Each of the drug addicts questioned was extremely interested and eager to help in every way to throw light upon this mystery. It was in this way that a confession of many of the practices of the narcotic-drug habitue were obtained from them. Only the pertinent facts incriminating the hypodermic syringe will be given here.

Most heroin and morphine addicts prefer to take their drug intravenously; they claim to obtain a greater "kick" taking it by this route. The drug is often purchased from peddlers in gelatin capsules, in which it is mixed with sugar of milk.

The hypodermic apparatus in common use in New Orleans consists of a medicine dropper to which a hypodermic needle is attached. To make the connection watertight, a cigarette paper is wrapped around the pipette of the medicine dropper. The drug is dissolved in water in a spoon, the top of a tobacco can, an oyster shell, or any other convenient container. The solution is generally boiled and then sucked into the medicine dropper, when it is ready for use.

When two or more addicts are together, it is usual for them to use a common hypodermic outfit of the kind described above. It is generally not cleaned between "shots." Sometimes the dosage of the drug for two or more addicts is prepared in one solution and the medicine dropper passed from one to the other for the injection of their respective shares. The price of the drug is often difficult to obtain, and sometimes three addicts will chip in together to buy two capsules. The method of division of the drug solution in one medicine dropper is then most convenient and is the one generally used under these circumstances.

The proof of the needle's entering the recipient's vein is the sight of blood in the pipette of the medicine dropper. Thus secondary users of the "outfit" are generally contaminated with the blood of the primary users. It is a known fact that minute quantities of malarial blood are sufficient for the transmission of the disease by intravenous injection.

At a local jail, on one occasion four drug addicts were caught in the act of preparing for the administration of the "drug" intravenously. Only one medicine dropper and hypodermic needle and several heroin capsules were found among them. At the New Orleans Marine Hospital such an outfit and a drug capsule were taken from one of the addict patients.

CASE I

T. G., white male, age 40, a native of Louisiana, was admitted to the marine hospital on October 10, 1932, with the complaint of chills and fever of a few days' duration. He admitted taking "dope" (heroin and morphine) intravenously since 1921. He had had malaria several years previously.

Physical examination showed an acutely ill patient with a temperature of 39.8° C. and pulse of 108. The veins of both forearms were blue and fibrosed. Breathing was of the asthmatic type, accompanied by numerous musical râles. The spleen was easily palpable and tender. Examination of the blood showed estivo-autumnal rings. The laboratory examinations were otherwise negative. The clinical course proved the case to be one of pernicious malaria necessitating intravenous quinine on account of the patient's critical condition and excessive vomiting. The disease was very resistant to quinine and there were two relapses during quinine therapy before recovery.

The source of the malaria in this patient was questioned at the time, since he had not been out of the city during the possible incubation period of the disease. He had been confined to a local prison. A recurrent malaria seemed doubtful because of its acuteness and severity. At the time the possible connection between malaria and the drug habit was not suspected in this case.

CASE II

R. M. Mc., white male, age 39, a merchant seaman, was readmitted on November 28, 1932, complaining of extreme weakness and fever. His sickness began 4 days before, with chills and fever. The patient stated that he had been a "dope addict" since 1920. Three years previously he had discontinued taking narcotics, but in the preceding month he had started again and had been using heroin intravenously ever since.

Examination showed an acutely ill patient with temperature of 39.4° C. and pulse of 100. Both forearms presented blue sclerotic veins. Blood smears showed estivo-autumnal parasites. The patient's stuporous condition and difficulty in swallowing made intravenous quinine therapy necessary at first.

After the malaria had become quiescent, the patient developed a transverse myelitis, of toxic origin (possibly malarial), at about the level of the second lumbar vertebra. He became discouraged and was caught with a medicine dropper and heroin capsule which a fellow addict had given him. On January 27, 1933, he was discharged at his own request and against medical advice. He was still unable to walk without support.

This was another severe case of malaria which it is believed was contracted through the hypodermic needle. It must be noted that the patient began using narcotics again by vein about a month prior to the onset of his disease. He had been previously treated in this hospital from July 14 to October 25, 1932, for bronchial asthma and chronic arthritis of the sacroiliac joints, and was apparently not using heroin at that time. No history of previous malaria was obtained on either admission. It was in the interval between the two hospitalizations that the patient encountered a group of narcotic addicts and started to use heroin again. There is evidence to the effect that he remained in the city of New Orleans during this period. His case developed in the post-mosquito season. The patient is known to have taken narcotics intravenously in the company of other addicts. These are the reasons for believing that he developed his malaria through the intravenous hypodermic needle route.

CASE III

R. H., white male, age 32, merchant seaman, living in New Orleans, was admitted on December 2, 1932, for treatment of drug addiction. It appeared that he had been in this city continuously for more than 1 month before this date. His past history was negative for malarial fever. His narcotic habit started through curiosity while in bad company in 1922. In 1925 he began using heroin intravenously and has used it regularly ever since except for a period of almost a year in 1929. During the preceding few months he had been taking about 4 grains daily. He wished to discontinue the drug habit and was willing to be placed in a strong room during treatment and to be kept off of "dope" entirely. There were no other complaints.

Examination showed a very poorly nourished individual who appeared older than the stated age. Height, 68 inches; weight, 114 pounds. He sat in a chair moaning and crying. His eyes had a starey look. The general appearance was that of weakness and emaciation rather than acute illness. The heart, lungs, and abdomen presented no abnormal findings, and the spleen was not palpable. The extremities were markedly emaciated, and all the muscles were weak and flabby. There was a coarse tremor of the extended fingers. Over the veins of both forearms were numerous bluish scars.

On the fourth hospital day the patient developed a fever which pursued an intermittent course with peaks up to 40° C. When this occurred he was taken out of isolation and transferred to the medical ward to facilitate his treatment. Blood smears showed estivo-autumnal parasites. Quinine therapy quickly checked the clinical course of the disease. He was discharged improved on December 23, 1932, with the advice to continue quinine in daily 10-grain doses for 2 months.

This patient developed malaria 4 days following admission. He had been using heroin intravenously for several weeks prior to hospitalization. It is known from different sources, and the patient admitted it himself, that he used the "drug" with other addicts, among whom were some of those who had since died of malaria (F. H., L. K., and P. R.). The incubation period was proper for malaria to have been injected intravenously with the heroin. All these addicts had malignant tertian (estivo-autumnal) malaria. It is believed that his malaria was not mosquito-borne, the season being against that possibility. On the other hand, all the evidence incriminates the "hypodermic syringe" in this case.

CASE IV

A. S., white male, age 26, admitted December 13, 1932, for influenza, discharged December 17, 1932, and readmitted December 21, 1932, with the complaint of pains over the whole body.

Examination showed an acutely ill patient with a fever of 40° C. and no other pertinent physical findings except scarred and sclerotic fore-arm veins. He admitted being a heroin user for a number of years. It was at first thought that he had a relapse of his influenza, and he was treated for this. Continuance of the fever and his previous association with another addict who had malaria (R. H.) indicated that blood examination was necessary. The blood smears showed estivo-autumnal plasmodia. Quinine therapy controlled the disease.

This patient had not been out of the city of New Orleans for several weeks before the onset of malaria. It was his first attack of malaria. Mosquito transmission seemed improbable on account of the season of the year. It is known that he had associated with a malarial addict recently. Both had the same type of parasites in their blood. R. H. confessed using the same hypodermic outfit with A. S. for the purpose of injecting heroin at the same sitting. He says that after having prepared a medicine dropper of "dope solution" he injected one third of the contents into one of his veins and passed it to A. S., who injected the balance into his vein. It is believed that this is the way in which A. S. contracted his malaria.

CASE V

J. G. H., white, male, age 28, seaman, whose home is New Orleans, entered the hospital on May 28, 1933, for treatment of chills and fever and swelling of face and feet. He stated that he had had chills and fever every third day for about a week. During the 2 preceding years he had been taking heroin or morphine intravenously. As long as he could get the drug he did not mind the chills and fever, but when his money gave out he came to the hospital for relief.

Examination showed an acutely ill patient with swollen face and ankles and a normal temperature. The heart and lungs were negative. The spleen was barely palpable upon deep inspiration. There were multiple bluish scars over the veins of both forearms near the elbows. Urinalysis showed albumin and casts, and the blood smear showed the quartan type of malarial plasmodia. Quinine therapy quickly cleared up the malaria and the urine became normal.

Upon questioning, this patient stated that he had not been away from the city of New Orleans for at least 6 weeks before the onset of his disease. It is very unlikely that he should have contracted mosquito-borne malaria, especially of the quartan type, in this city.

The patient further admitted taking heroin intravenously in the company of other narcotic addicts. A week or 10 days before developing his first chill he remembered injecting himself intravenously with the same medicine dropper hypodermic outfit which had just been used by another heroin addict (J. J.). He knew that some of J. J.'s blood entered the medicine dropper but he did not think that this would be harmful. J. J. is a seaman who had made numerous trips to the tropics and had recently come from Galveston. It is regretted that J. J. could not be examined, as he had left on his ship shortly after his association with J. G. H. In this case the transmission of malaria by the "hypodermic syringe" route is also feasible.

These five cases stimulated the writer to investigate the cause of deaths of the narcotic addicts who had so dramatically passed out of the picture in New Orleans in the late fall of 1932. Their names were freely given by the several addicts who had known them in life as follows: G. B., L. K., F. H., P. D., P. R., and T. M.

The death certificates were kindly furnished by the New Orleans Board of Health and the coroner's office. It was startling to find that

five of them had died of malaria, presumably of the pernicious estivo-autumnal type. It is probable that the other one also had died of malaria.

G. B., white male, age 38, seaman, had been treated at the marine hospital during the preceding fiscal year for pulmonary tuberculosis, tertiary syphilis, and drug addiction—heroin and morphine. He was discharged on June 28, 1932. After his discharge it was learned that he associated with a group of narcotic addicts and that he did not leave the city as had been his intention. It is known that during November 1932, he had used heroin intravenously in company with others. On the 19th of that month he had a severe chill and fever and was so shaky that he was unable to administer the heroin to himself. A friend (J. C. A.) prepared a medicine dropper of heroin solution sufficient for two and injected G. B. intravenously with half of the contents. Immediately thereafter he injected the remainder into his own vein. Three days later G. B. was admitted to Charity Hospital, New Orleans. He died there the following day of comatose malaria.

J. C. A., who had been a narcotic habitue for 15 years, was afterwards admitted to the marine hospital in New Orleans on January 29, 1933, for the treatment of an infected foot. Examination failed to show any signs of malaria, and his spleen was not enlarged. Repeated and concentrated blood examinations for malaria were negative. (This case is reported so as to be fair and present both sides of the question.) The conditions for the transmission of malaria by the "hypodermic syringe" were ideal in this instance and yet it did not materialize. Individual resistance to the disease may be the explanation.

P. D., white male, age 27, seaman, a native and resident of New Orleans and a former patient at this marine hospital, died on November 4, 1932, at Charity Hospital of malarial fever and narcotic addiction. Through other narcotic addicts it was learned that he had recently used heroin intravenously with G. B., F. H., R. H., and L. K., among others.

L. K., white male, age 27, laborer, resident of New Orleans, died of comatose malaria at Charity Hospital on November 15, 1932. It is known that he was a drug addict and a peddler. Shortly before his death he had used heroin intravenously with F. H., P. D. and others.

F. H., white male, age 27, seaman, resident of New Orleans, died of comatose malaria at Charity Hospital on November 17, 1932. He is known to have been a narcotic addict and a peddler. Some of the addicts and others who knew him during life testified that he had used heroin intravenously in company with others, G. B. and L. K. among them, up to the time of his death.

P. R., white male adult, resident of New Orleans, died at Charity Hospital, New Orleans, of comatose malaria and drug addiction on December 16, 1932. He was a heroin addict, using the drug intravenously, and is known to have associated with those who died before him as well as with other addicts.

T. M., white male adult, resident of New Orleans, died December 7, 1932, at the Federal jail in New Orleans, where he was known to be a narcotic addict, using the drug intravenously. He had been sick since November 17, 1932, with an irregular type of fever up to 39.2° C. and was thought to have influenza. Twenty-four hours before death he became comatosed. Spinal fluid survey was negative. Special examination of blood for malaria was not done. It is reported that he was associated and used heroin intravenously with most of the drug addicts who died of comatose malaria in New Orleans. This case can only be regarded as suspicious and it is regrettable that the blood was not examined for plasmodia.

It is learned that a similar outbreak of malaria among narcotic addicts occurred at Galveston. At least four cases were treated at John Sealy Hospital between February and May 1933. Three of these cases were of the quartan type. The other patient died and a diagnosis of malaria was made at post mortem. All of these patients were heroin addicts and showed evidence of using the drug intravenously.

SUMMARY AND CONCLUSIONS

1. Five cases of malarial fever in narcotic addict patients of the New Orleans Marine Hospital occurring during the fiscal year 1932–33 are briefly reviewed. Five deaths from malaria among the narcotic addict population of New Orleans are reported during the same period. A similar outbreak of malaria in narcotic drug addicts has occurred recently at Galveston.
2. Evidence of the transmission of malaria by the hypodermic syringe among these cases is submitted.
3. From the above-mentioned cases the malaria occurring among narcotic habitues seems to be of the pernicious type. This is perhaps a further argument incriminating the hypodermic syringe in malaria transmission.
4. It is realized that the number of cases reported are too few to permit definite conclusions, but the publication of information concerning them seems justifiable to stimulate further clinical observation along similar lines.
5. Mosquito-borne malaria is usually a rural disease. The malaria spreading among the addict population is likely to be of urban distribution, since the majority of addicts live in the larger cities.
6. It has been estimated that there is at least one narcotic drug addict to each thousand of the general population of the United States (3), and the danger of their spreading malaria in our southern cities as well as in cities farther north, where this disease is unknown, seems to be a real one.
7. If the hypodermic syringe must be accepted as a means of conveying malaria among narcotic addicts, then a new chapter in the epidemiology of this disease has been opened.
8. This should be an added incentive to the efforts of the Federal, State, and municipal health agencies in their fight for the enforcement of adequate narcotic suppressive measures.

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A FORM OF EXPERIMENTAL ENDOCARDITIS PRODUCED IN RABBITS

By O. F. Hedley, *Passed Assistant Surgeon*, and Edythe J. Rose, *Associate Bacteriologist*, *United States Public Health Service*

Acute and subacute ulcerovegetative endocarditis not infrequently has been produced experimentally in animals. The work here reported is of interest because of the method used and because the lesions, although not differing from those reported by other observers, occurred entirely on the right side of the heart. In addition to the endocarditis, pericarditis and arthritis frequently occurred.

Reference is made to reviews of experimental endocarditis by Simons,[1] Bargen,[2] Kinsella,[3] and workers in the Pickett-Thomson laboratory.[4] Acute and subacute endocarditis has been produced with streptococci, staphylococci, and pneumococci, obtained either from human cases of endocarditis or rheumatic fever or from the normal flora. Rosenow [5] noted the tendency for the lesions to localize on either the right or left side of the heart. In 1916 Detweiler and Robinson [6] reported lesions in the right side of the heart, similar to those described in this article, produced by injecting *Streptococcus viridans* cultures intravenoulsy into rabbits.

The streptococci and extracts of cardiac tissues were obtained through the courtesy of Dr. Wallace M. Yater from a patient at the Georgetown University Hospital, Washington, D.C. The case was that of a rheumatic adhesive pericarditis with a terminal streptococcus septicemia. The etiologic factor of rheumatism being unknown, it is not possible to state the relationship of the septicemia to the original infection. Alpha prime streptococci were isolated by blood culture during life and from cultures of the heart blood and pericardial fluid at necropsy. The report of this case by Yater and Hedley will shortly appear in the literature.

EXPERIMENTAL DATA

The results of the experiments on rabbits are displayed graphically in the accompanying chart.

One monkey was injected intravenously with 20 cc of the patient's whole blood. There resulted no evidence of rheumatism or heart disease. Necropsy at the end of seven weeks was negative.

Three monkeys were injected intravenously with 10 cc of the original cultures of alpha prime streptococci obtained from the

[1] Quart. J. Med., 7: 291 (1914).
[2] Arch. Int. Med., 32: 727 (1923).
[3] Ibid., 19: 367 (1917).
[4] Annals of the Pickett-Thomson Research Laboratory, vol. IV, 1928-29.
[5] J. Infec. Dis., 6: 245 (1909).
[6] Jour. Am. Med. Assoc., 67: 1653 (1916).

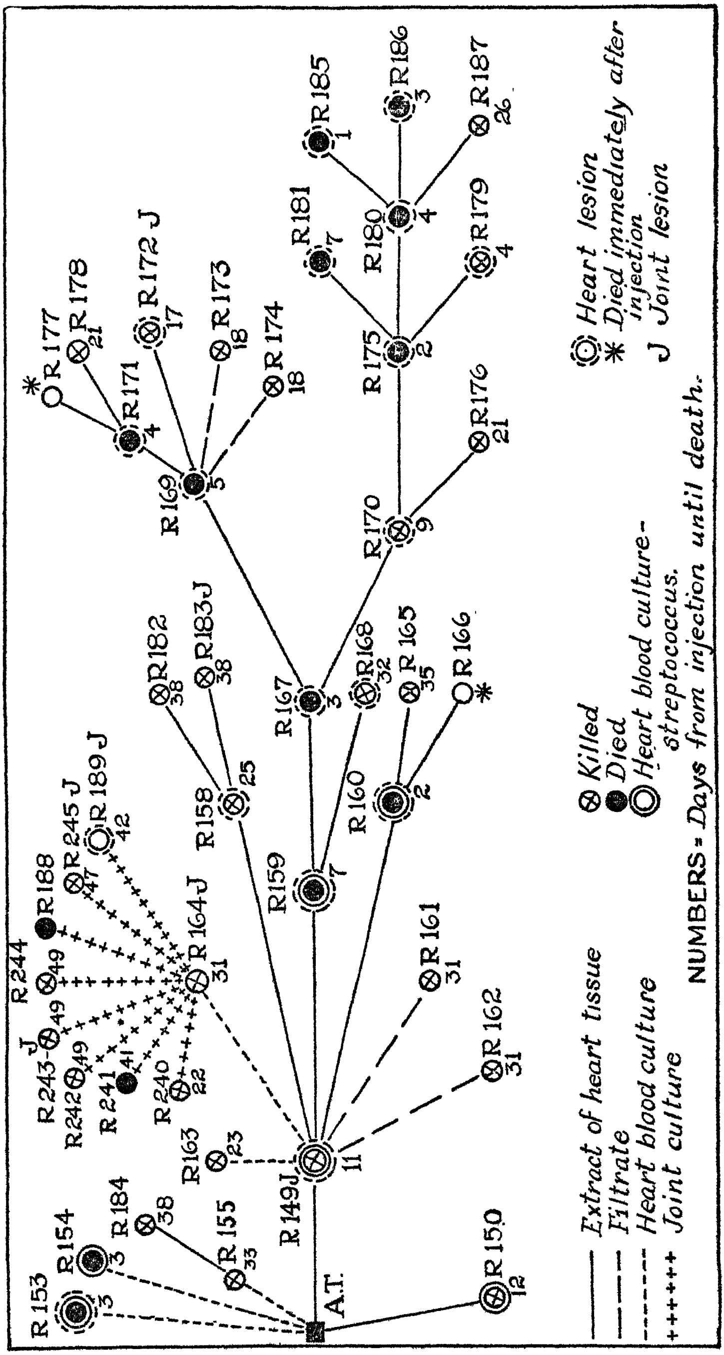

FIGURE 1.—Results in rabbits injected with cultures and tissue extract from A. T.

patient. One animal was moribund the next day, and at necropsy evidence of an overwhelming infection was noted. An acute splenitis was found, but there was no evidence of heart disease. The two other monkeys developed arthritis, tending first to migrate from joint to joint and subsequently to settle in a single joint—in one instance the left knee and in the other the right. The arthritis was accompanied by fever and generalized malaise. The conditions cleared up with little or no residual changes other than rarefaction of the bones, apparently due to disuse.

Three rabbits (R 153, R 154, R 155) were injected intravenously with original cultures of alpha prime streptococci obtained from the patient. One of the animals (R 153) which died three days later, at necropsy showed a whitish discoloration throughout the ventricular musculature, particularly near the apex. Microscopic examination revealed necrosis, cloudy swelling, and the presence of streptococci in the region of the necrosis. No giant cells were found. Alpha prime streptococci were found in the heart blood. The second animal (R 154) died in three days; and while alpha prime streptococci were obtained from the heart blood at necropsy, there was no evidence of heart disease. The third animal (R 155) was killed at the end of 33 days. There was no evidence of heart disease.

A portion of the myocardium and overlying epicardium from the patient was ground up in a sterile mortar, saline added, and the mixture passed through gauze. A monkey was intravenously injected with 15 cc of this extract. Two days later it became violently ill and was found dead the next morning. Necropsy revealed a pale, friable myocardium filled with whitish areas of necrosis. The valves and pericardium were negative. Microscopic examination showed irregular loss of striations in the muscle fibers, cloudy swelling, and necrosis. Abscesses were noted throughout the myocardium. Organisms were seen in the areas of necrosis. An occasional bacterial thrombus was seen in the capillary vessels. There was nothing to suggest rheumatic infection. Other organs showed evidence of massive infection. The heart blood showed alpha prime streptococci.

Two rabbits (R 149 and R 150) were injected with the extract. One (R 150) was killed at the end of 12 days. While no evidence of heart disease or joint involvement was noted, alpha prime streptococci were grown from the heart blood. The other animal (R 149) at the end of 11 days became violently dyspnoeic and pain was elicited on palpation of the tarso-metatarsal and phalangeal joints of the left hind limb. This animal was killed. Necropsy revealed that the pericardium was distended with a clear, but floculent, gelatinous fluid. The myocardium was filled with whitish areas, apparently of necrosis. The valves were negative. On the interventricular septum, and extending to the wall of the right ventricle, a large vegetation,

1.2 by 0.5 cm was implanted. Microscopic examination revealed an acute vegetative endocarditis with necrosis and leucocytic infiltration of the adjacent muscle. The epicardium revealed mesothelial swelling and more or less uniform infiltration with lymphocytes and monocytes. Cocci were abundant, particularly in the vegetation. The organisms were recovered from the heart blood and pericardial fluid.

Two cubic centimeters of the extract of cardiac tissues of R 149 were injected intravenously into three rabbits (R 158, R 159, R 160), all of which developed vegetations in the right ventricle, and one a pericardial condition similar to that described in the case of R 149. Alpha prime streptococci were obtained from the heart blood at necropsy of two of these animals (R 159 and R 160). Extracts of the cardiac tissues of these three animals were injected into other animals. The extracts from R 158 and R 160 failed to develop cardiac lesions. One of the animals (R 183) developed a joint lesion. Both of the animals (R 167 and R 168) injected with the extract of cardiac tissues from R 159 developed cardiac lesions in the right ventricle. In each instance the findings were those of acute vegetative and ulcerative endocarditis. The vegetations were quite large, nearly causing stenosis of the auriculo-ventricular orifice.

The extracts of cardiac tissues from R 167 were injected into two other rabbits (R 169 and R 170) and similar lesions were produced. The experiment was thus continued until the seventh passage, at which point it was discontinued. The lesions were similar to those described in the case of R 149, with the exception that toward the latter part of the experiment it was not possible to demonstrate organisms in the vegetations. Cultures of the heart bloods toward the latter part of the experiment were negative. The lesions were uniformly on the right side of the heart, either on the wall or interventricular septum of the right ventricle, right auriculo-ventricular valve, or pulmonary conus.

Due to the rapidity with which the lesions were formed, it was considered likely that the condition may have been caused by the fibrin of the extract being deposited on the chordae tendinae of the right ventricle, with subsequent proliferation of organisms. Against this theory is the observation that in no single instance did pneumonia occur, nor was there evidence of pulmonary infarction. Five rabbits were intravenously injected with 2 cc of normal rabbit heart extract and three (none shown on the chart) with 2 cc of a mixture of normal rabbit heart extract to which alpha prime streptococci were added. The results in both instances were negative. The organisms used in this work were stock cultures obtained originally from this case, but may have been attenuated in the 6 months intervening between

the time these organisms were obtained and this part of the experiment was performed.

To rule out the possibility of a filterable virus, portions of the extracts from R 149 and R 169 were passed through Berkefeld filters and 2 cc of the filtrate injected intravenously into other rabbits. The results were negative.

Streptococcal cultures from the heart blood of R 149 were injected into two rabbits. One animal (R 163) showed no evidence of disease at necropsy at the end of 23 days; the other animal (R 164) after 12 days developed tenderness and swelling of the left elbow joint. It was killed at the end of 30 days and a creamy, purulent pus was found in the joint. The heart was negative. Alpha prime organisms were obtained from the pus. These organisms were injected into two other animals, one of which (R 188) died in a day. No lesions were found. The other (R 189) developed arthritis of the right wrist joint. On necropsy at the end of 6 weeks the heart was grossly normal. Microscopic examination revealed an occasional focus of pericapillary fibroblastic proliferation with endothelial swelling. In these areas a few lymphocytes were seen. In the muscle of the atrium an area of loose connective tissue proliferation interrupted the muscle fibers. The capillaries in this region were prominent and showed large proliferating fibroblasts in the surrounding tissue, as well as moderately dense infiltrations of lymphocytes and plasma cells. Only some of the cells could be classified as of giant size. The central vessel in the nodule showed endothelial swelling with partial obliteration. The interrupted fibers revealed perinuclear vacuolarization and increased acidophilia. The valve itself was not affected. These findings are regarded as those of a subacute focal myocarditis suggestive of the rheumatic type. Subsequently six other animals (R 240, R 241, R 242, R 243, R 244, R 245) were injected intravenously with 2 cubic centimeters of the R 164 culture. Two (R 243 and R 245) developed mucopurulent arthritis, but in none was there evidence of heart disease. In view of the inconstancy of the findings, little significance is attached to these lesions.

SUMMARY

Three monkeys were injected with fresh cultures of alpha prime streptococci from the patient. Two developed arthritis and one died of toxemia. No evidence of heart disease was found. One monkey injected with an extract of cardiac tissues developed an acute bacterial myocarditis. Thirteen rabbits were injected with streptococci from the original case or subsequent cases. Four developed arthritis and two myocarditis. Four rabbits were injected with extracts of the cardiac tissues passed through Berkefeld filters. None developed

disease. Twenty-six rabbits were injected with extracts of heart tissues from the patient or from animals having endocarditis. Two died instantly; 15 developed acute right ventricular endocarditis of bacterial origin; and 3 developed joint conditions.

DISCUSSION

The foregoing experiments are of interest, not because of the type of lesions produced, but in the constancy with which right-sided lesions were produced by the method used. There is no evidence that they are rheumatic or even represent a pathological entity, the animal equivalent of rheumatic fever in man. It would appear that streptococci have a tendency to lose virulence. It is not to be inferred that these organisms have any special affinity for the right side of the heart, since when injected by other methods, the organisms failed so to act. It is rather believed that the infection of the right side of the heart was due to the admixture of these organisms with particles in the heart tissue extracts. The failure of subsequent experiments was probably due to attenuation of these organisms.

CONCLUSIONS

1. Acute ulcerovegetative endocarditis of the right side of the heart was produced by intravenously injecting extracts of cardiac tissues obtained from infected sources. This was carried out for several passages.
2. Streptococci appear to be readily attenuated.
3. There is no evidence to suggest that the above-mentioned condition had any relationship to rheumatic heart disease.

LEAD POISONING IN A STORAGE BATTERY PLANT

A report has recently been issued by the Public Health Service on a study of the lead hazard in a storage battery plant.[1] The investigation included a plant survey, the determination of lead dust and fumes in the air, a record of employment and of disabling illness (especially compensation cases of plumbism), physical examinations, and blood and urine analyses.

Environmental factors.—In all, 68 samples of atmospheric lead dust or fumes were obtained with the impinger apparatus. The average in the various departments (account being taken of the proportion of time spent in each activity) was as follows: Mixing, 120 milligrams per 10 cubic meters of air; pasting, 60; burning, 5.7; foundry (except pit), 1.2; other departments, 2.0; outdoors, 1.1; first aid room, 0.20.

[1] Lead Poisoning in a Storage Battery Plant. By Albert E. Russell, Roy R. Jones, J. J. Bloomfield, Rollo H. Britten, and Lewis R. Thompson. Public Health Bulletin No. 205.

A study of the lead compounds used or formed in the various work-rooms showed that comparatively soluble forms of lead were present.

In addition to the hazard due to inhalation of dust and fumes, there was evidence of ingestion of lead dust through careless personal habits on the part of many employees.

Physical examinations.—The important subjective symptoms noted were colic, weakness, myalgia, nausea and vomiting, loss of appetite, constipation, nervousness and irritability, and bad taste in the mouth. The important objective findings were pallor, jaundice, tremor, reflex changes, and pathological changes in the blood and urine.

Blood examinations.—The average stipple count found in this study was about 300 per 100,000 red cells, the examinations being made on workers coming to the plant dispensary and presumably leaded. Although no reading on a control was 10 or more, 1,424 out of 1,575 readings on the exposed group (90 percent) were 10 or more. However, the wide fluctuation from count to count on the same person, the lack of any increase with additional absorption of lead, the widely different counts at the time individuals were placed on compensation for plumbism, and the lack of correlation between length of case and stipple count, all go to show that the actual number of stippled cells found cannot be taken as a measure of the amount of lead absorbed or of the effect on the worker. In spite of wide individual variation, there was a parallel increase in the number of stippled cells and of reticulocytes. The conclusion was reached that estimation of reticulocytes offered the most practicable method at the present time for the determination of early lead absorption.

A decrease in platelets was demonstrated as frequently associated with prolonged exposure to lead. The average count in 42 cases of moderately severe plumbism was 139,000 per cubic millimeter. The anemia was demonstrated to be a secondary type, with corresponding decreases in total red blood cells and hemoglobin.

Urinalyses.—If the presence of albumin, red blood cells, or granular casts be taken as indicative of irritation of the kidneys, the specimens from the group of leaded workers offered a marked contrast to the controls. Thirty-seven percent showed granular casts as against 7.5 percent of the controls.

Compensation cases of plumbism.—The incidence of plumbism sufficiently severe to receive compensation was extremely high—the annual rate for all workers being 15.9 per 100. The total number of compensation cases observed was 158. There was a close correlation between lead exposure in the different departments and the risk of developing a case of lead poisoning or of showing other evidence of lead absorption. In the mixing department (average concentration 120 milligrams per 10 cubic meters of air), there was an appreciable

risk even in the first month. The monthly plumbism rate then rose rapidly until it reached 44 per 100 (third to sixth month).

The importance of the lead hazard in this plant from an economic point of view was shown by the time spent on compensation, which, in the mixing department, rose to the level of 33 percent in the third month of exposure to lead. There was a great variability in the individual duration of compensation cases.

Except for prolonged exposure, it appears that the limit of safety under the conditions encountered in this study is an atmospheric concentration of lead dust or fumes of less than 1.5 milligrams per 10 cubic meters of air.

COURT DECISION RELATING TO PUBLIC HEALTH

Ordinance prohibiting sale in city of ice manufactured outside of city, unless made with distilled water, held valid.—(Texas Commission of Appeals, Sec. B; *City of El Paso et al.* v. *Jackson et al.*, 59 S. W. (2d) 822; decided May 3, 1933.) An ordinance of the city of El Paso provided as follows:

Sec. 1. It shall be unlawful for any person, firm, or corporation to sell or offer for sale or distribute in the city of El Paso any ice manufactured outside the city of El Paso except ice manufactured wholly with distilled water.

Sec. 2. Any person violating the foregoing ordinance shall be deemed guilty of a misdemeanor and shall be fined the sum of $10 and each sale or offering for sale shall constitute a separate offense.

A suit was brought against the city and certain of its officials by persons engaged in selling ice in El Paso, which ice was manufactured from raw water in the city of Juarez, Mexico, and brought from Mexico in trucks and wagons. The trial court, being of the opinion that the ordinance was void because discriminatory and imposing a burden on interstate commerce, perpetually enjoined the city and certain of its officials from enforcing or threatening to enforce the ordinance. The trial court's judgment was affirmed by the court of civil appeals and the city and the other defendants appealed.

It appeared that the city of El Paso had no way of enforcing periodic and proper inspection of the water in Juarez from which ice was manufactured, while within El Paso the water from which ice was made was tested as to its purity by the city health department. The commission of appeals took the view that the matter had been settled adversely to the defendants in error by the decision of the United States Supreme Court in *Adams* v. *City of Milwaukee*, 228 U.S. 572, 33 S.Ct. 610, 57 L.Ed. 971. In that case there was involved the validity of an ordinance of the city of Milwaukee, which prohibited bringing into the city or selling or offering for sale therein milk or cream drawn from cows outside of said city unless (among other requirements)

the owner of such cows had filed in the office of the health commissioner a certificate that such cows had been tested with tuberculin and found free from tuberculosis or other contagious diseases. It was contended that the ordinance was unconstitutional in that it was partial and unequal in its operation as it applied to dealers in milk drawn from cows outside the city, while dealers in milk drawn from cows within the city were not included in its terms or subject to its requirements. The supreme court of Wisconsin, the judgment of which court was affirmed by the United States Supreme Court, held that the differences in the situation of the milk producing animals and in the facilities for inspection and investigation were sufficient to authorize the common council to legislate with reference to milk shipped into the city and make police regulations applying to dealers in and shippers of such milk separate from and different from the regulations applying to cows within the city. Comparing the Adams case with the instant case, the commission of appeals stated:

> We see no difference in principle between that case [the *Adams case*] and the one under consideration. In the one case, foreign cows producing the milk must be injected with tuberculin; in the other, water out of which foreign ice is produced must be distilled.
>
> * * * * * * *
>
> There, as here, the petitioner claimed that the most the city could do was to require the milk to be pure and wholesome, but the supreme court said the city had the right to require an injection into those cows outside the city as a measure of assurance of its purity, just as here the city requires the injection of heat to the water to assure its purity.

The conclusion of the commission of appeals was that the ordinance of El Paso was valid. The judgments of the trial court and of the court of civil appeals were both reversed and judgment was rendered for the plaintiffs in error.

DEATHS DURING WEEK ENDED AUGUST 5, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Aug. 5, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	7,582	6,253
Deaths per 1,000 population, annual basis	10.6	8.9
Deaths under 1 year of age	550	513
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	46	42
Deaths per 1,000 population, annual basis, first 31 weeks of year	11.3	11.6
Data from industrial insurance companies:		
Policies in force	67,678,825	71,503,898
Number of death claims	11,185	11,858
Death claims per 1,000 policies in force, annual rate	8.6	8.7
Death claims per 1,000 policies, first 31 weeks of year, annual rate	10.2	10.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Aug. 12, 1933, and Aug. 13, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Aug. 12, 1933, and Aug. 13, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug 12, 1933	Week ended Aug. 13, 1932	Week ended Aug 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932
New England States:								
Maine					4	9	0	0
New Hampshire					3	3	0	0
Vermont		2			8	12	0	0
Massachusetts	15	29		1	77	71	1	0
Rhode Island					2		0	0
Connecticut	2	4	3		10	14	0	1
Middle Atlantic States:								
New York	26	54	[1] 4	[1] 1	204	176	7	4
New Jersey	5	16		3	28	70	1	0
Pennsylvania	40	29			116	72	4	5
East North Central States:								
Ohio	24	31	21	10	15	55	3	2
Indiana	11	27	18	16	4	2	4	3
Illinois	9	34	3	4	18	34	6	7
Michigan	20	17	3		28	168	0	0
Wisconsin	4	6	22	13	38	35	1	0
West North Central States:								
Minnesota	5	7	1	1	11	8	0	1
Iowa [2]	9	6				1	1	0
Missouri	12	15		2	12	3	1	1
North Dakota		7			18		0	0
South Dakota	3	2	4			1	0	0
Nebraska		3			6	3	0	1
Kansas	7	10	2	1	11	9	0	1
South Atlantic States:								
Delaware	1					1	2	0
Maryland [2 3]	4	6	1	1	2	4	0	0
District of Columbia [3]	8	3		1	10	1	0	0
Virginia [4]	13	22			31	17	0	1
West Virginia	23	11	8	61	14	14	1	1
North Carolina [3]	23	15		20	34	31	1	1
South Carolina [4]	5	6	61	88	34	7	0	0
Georgia [4]	23	11		5	36		3	2
Florida	6	14		4	24		0	0
East South Central States:								
Kentucky	18	25					3	2
Tennessee [3 4]	11	9	3	6	21	5	2	1
Alabama [4]	27	28	11	1	6		1	0
Mississippi	13	21					0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Aug. 12, 1933, and Aug. 13 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932
West South Central States:								
Arkansas	3	5		2	42		0	0
Louisiana	13	17	2	10	2	11	0	0
Oklahoma [5]	8	22		16	2		1	0
Texas [4]	54	53	15	22	82	7	0	0
Mountain States:								
Montana	1			4	2	15	0	0
Idaho					3		0	0
Wyoming		1			4	4	0	0
Colorado	3	7			2	2	1	0
New Mexico		22		2		1	0	1
Arizona	3		1		2	6	0	0
Utah [2]			1		18		0	0
Pacific States:								
Washington		1		1	15	3	0	0
Oregon	1		9	4	16	10	0	0
California	16	24	13	53	97	34	2	2
Total	469	622	206	353	1,112	919	46	37

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932
New England States:								
Maine	2	3	4	16	0	0	4	4
New Hampshire	0	0	7	5	0	0	0	2
Vermont	1	0	7	4	0	0	0	0
Massachusetts	29	2	50	80	0	0	2	7
Rhode Island	1	0	4	5	0	0	1	0
Connecticut	2	0	12	11	0	0	3	4
Middle Atlantic States:								
New York	100	17	85	120	0	0	64	59
New Jersey	9	15	14	27	0	0	4	14
Pennsylvania	27	71	113	68	0	0	49	38
East North Central States:								
Ohio	15	7	122	111	1	3	52	64
Indiana	0	0	22	13	0	3	32	26
Illinois	6	6	92	94	1	1	30	79
Michigan	2	3	64	74	1	0	8	15
Wisconsin	2	1	9	6	10	0	3	4
West North Central States:								
Minnesota	11	5	15	21	1	0	0	1
Iowa [2]	2	3	13	7	1	2	1	3
Missouri	2	1	11	13	0	2	20	20
North Dakota	6	0	5	1	0	5	0	4
South Dakota	3	0	2		0	0	7	0
Nebraska	0	1	3	6	0	1	2	3
Kansas	2	0	23	11	0	4	8	21
South Atlantic States:								
Delaware	0	0	3	2	0	0	4	2
Maryland [2 3]	1	2	27	15	0	0	19	46
District of Columbia [3]	0	0	5	6	0	0	0	3
Virginia [4]	2	1	25	37	0	0	50	64
West Virginia	4	2	17	6	6	0	61	46
North Carolina [3]	0	2	36	27	0	0	24	44
South Carolina [4]	1	1	1	3	0	0	34	56
Georgia [4]	0	0	7	2	0	0	48	55
Florida	0	0		1	0	0	7	4
East South Central States:								
Kentucky	2	1	49	7	0	3	120	130
Tennessee [3 4]	5	4	33	31	0	0	73	132
Alabama [4]	1	0	16	14	0	0	31	31
Mississippi	0	0	5	5	0	1	24	36
West South Central States:								
Arkansas	0	1	1	1	0	0	25	26
Louisiana	0	3	9	6	6	2	55	31
Oklahoma [5]	0	2	3	15	0	0	27	74
Texas [4]	5	0	18	23	5	4	98	47

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Aug. 12, 1933, and Aug. 13, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932	Week ended Aug. 12, 1933	Week ended Aug. 13, 1932
Mountain States:								
Montana	0	0	5	12	0	8	8	3
Idaho	1	0	1		1	0	3	2
Wyoming	0	0	1		0	0	0	0
Colorado	0	1	7	5	2	0	4	3
New Mexico	0	0	4	3	0	0	8	15
Arizona	0	1	7	2	0	0	5	0
Utah [2]	0	0	1	2	0	0	2	0
Pacific States:								
Washington	0	1	5	14	1	4	3	7
Oregon	2	0	10	4	4	0	0	2
California	3	5	49	40	14	13	9	16
Total	249	162	1,022	976	63	56	1,032	1,243

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Rocky Mountain spotted fever, week ended Aug. 12, 1933, 6 cases, as follows: Maryland, 2; District of Columbia, 1; North Carolina, 2; Tennessee, 1.
[4] Typhus fever, week ended Aug. 12, 1933, 58 cases, as follows: Virginia, 1; South Carolina, 2; Georgia, 18; Tennessee, 1; Alabama, 28; Texas, 8.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
June 1933										
Mississippi	4	10	443	4,838	588	1,142	1	23	4	96
July 1933										
Arizona	1	11	2	1	57		0	15	1	21
Florida		13	2	48	107	6	2	3	0	10
Indiana	8	46	49	4	84		1	81	1	59
Maine	1	3	8		14		1	20	0	12
Michigan		109	7	5	434		6	429	5	25
Missouri	13	112	4	59	295		7	78	8	84
New Mexico	1	15	1	13	44	2	0	6	4	14
Tennessee	5	39	40	486	332	75	25	51	0	405
Texas	12	230	261		722	71	7	151	70	325
Vermont		2			88		0	16	0	2

June 1933	Cases
Mississippi:	
Chicken pox	251
Dengue	20
Dysentery (amebic)	121
Hookworm disease	337
Mumps	126
Puerperal septicemia	20
Trachoma	6
Whooping cough	1,388
July 1933	
Anthrax:	
Indiana	1
Texas	3
Chicken pox:	
Arizona	14
Indiana	24
Maine	82
Michigan	207
Missouri	31
New Mexico	6
Tennessee	13
Texas	107
Vermont	30
Conjunctivitis:	
New Mexico	4
Dengue:	
Florida	1
Texas	7
Dysentery:	
Arizona	8
Florida	4
Missouri	4
Tennessee	107
Texas	248
German measles:	
Maine	12
Michigan	132
Tennessee	53
Impetigo contagiosa:	
Tennessee	7
Lethargic encephalitis:	
Michigan	1
Tennessee	4
Texas	1

	Cases
Mumps:	
Arizona	10
Florida	15
Indiana	7
Maine	11
Michigan	168
Missouri	89
New Mexico	19
Tennessee	24
Texas	96
Vermont	87
Ophthalmia neonatorum:	
Tennessee	1
Texas	3
Paratyphoid fever:	
Florida	1
Indiana	2
Maine	1
Tennessee	3
Texas	17
Puerperal septicemia:	
New Mexico	2
Tennessee	1
Rabies in animals:	
Indiana	40
Maine	1
Missouri	10
Texas	4
Scabies:	
Tennessee	2
Septic sore throat:	
Michigan	14
Missouri	7
Tennessee	2
Tetanus:	
Missouri	1
Tennessee	4
Texas	3
Trachoma:	
Arizona	13
Tennessee	35
Texas	10
Tularaemia:	
Tennessee	1
Texas	6
Typhus fever:	
Florida	11
Texas	90
Undulant fever:	
Arizona	2
Florida	2
Indiana	1
Michigan	9
New Mexico	2
Texas	6
Vermont	1
Vincent's angina:	
Maine	1
Michigan	53
Tennessee	1
Whooping cough:	
Arizona	25
Florida	23
Indiana	203
Maine	26
Michigan	1,263
Missouri	1,[illegible]78
New Mexico	[illegible]
Tennessee	[illegible]
Texas	[illegible]
Vermont	[illegible]

LETHARGIC ENCEPHALITIS, ST. LOUIS, MO.

From July 31 to August 22, 1933, 123 cases of lethargic encephalitis, with 13 deaths, were reported in St. Louis County, Mo., and 28 additional cases with 3 deaths were reported in the city of St. Louis.

PLAGUE IN CALIFORNIA

A case of human plague has been reported at Whittier, Los Angeles County, Calif., onset July 31, death occurring August 9, 1933.

Under date of August 15, 1933, 2 plague-infected ground squirrels were reported found in a lot of 37 squirrels shot on the Joe Serpa Ranch, 13 miles southeast of Tres Pinos, San Benito County, Calif. The squirrels were received at the State bacteriological laboratory August 5, 1933.

WEEKLY REPORTS FROM CITIES

City reports for week ended Aug. 5, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0		0	1	0	0	0	0	0	0	17
New Hampshire:											
Concord	0		0	0	0	0	0	1	0	0	9
Nashua	0		0	0	0	0	0	0	0	5	0
Vermont:											
Barre	0		0	7	0	0	0	0	0	0	1
Burlington	0		0	0	0	0	0	0	0	1	7
Massachusetts:											
Boston	5		0	29	17	14	0	7	1	71	170
Fall River	0		0	1	1	3	0	2	1	5	30
Springfield	0		0	0	0	0	0	0	2	4	32
Worcester	0		0	15	2	3	0	2	0	6	46
Rhode Island:											
Pawtucket	0		0	0	0	0	0	0	0	0	16
Providence	1		0	0	1	8	0	2	0	27	54
Connecticut:											
Bridgeport	0		0	7	1	2	0	0	0	0	24
Hartford	0		0	0	2	7	0	1	0	0	39
New Haven	1		0	2	1	1	0	0	0	5	20

City reports for week ended Aug. 5, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
New York:											
Buffalo	2		0	9	10	3	0	5	0	35	107
New York	22	1	2	49	99	22	0	90	29	144	1,569
Rochester	0		0	0	3	2	0	1	1	10	67
Syracuse	0		0	0	2	0	0	1	0	16	44
New Jersey:											
Camden	0		0	0	1	1	0	1	1	0	26
Newark	0		0	3	4	4	0	3	1	39	80
Trenton	0		0	2	1	0	0	1	2	3	41
Pennsylvania:											
Philadelphia	0	1	0	36	10	18	0	24	3	19	450
Pittsburgh	9		0	2	7	17	0	6	3	118	140
Reading	4		0	2	1	0	0	1	0	13	29
Ohio:											
Cincinnati	0		2	4	5	4	0	13	0	27	153
Cleveland	5	13	0	1	7	7	0	10	3	54	174
Columbus	0		0	0	3	7	0	1	2	6	77
Toledo	1	1	0	1	1	14	0	3	0	14	52
Indiana:											
Fort Wayne	1		0	0	2	1	0	0	0	2	21
Indianapolis	0		0	4	5	2	0	1	1	6	
South Bend	0		0	0	0	2	0	1	0	0	11
Terre Haute	0		0	1	0	0	0	0	0	3	9
Illinois:											
Chicago	1	2	1	15	28	44	0	47	2	102	610
Springfield	1		0	1	2	1	0	0	0	1	20
Michigan:											
Detroit	8	1	0	0	5	15	0	17	2	99	240
Flint	0		0	0	0	1	0	1	1	5	22
Grand Rapids	0		0	0	1	2	0	1	0	26	22
Wisconsin:											
Keosha	0			0		0	0		0	10	7
Milwaukee	1		0	5	3	3	0	4	0	214	84
Racine	0		0	0	0	2	0	1	0	53	6
Superior	0		0	0	0	0	0	0	0	17	5
Minnesota:											
Duluth	0		0	1	0	1	0	0	0	13	16
Minneapolis	0		0	1	2	3	0	1	1	2	98
St. Paul	0		0	0	3	0	0	2	1	35	52
Iowa:											
Davenport	0			0		0	0		0	0	
Des Moines	2			0		5	0		0	0	18
Sioux City	2			0		0	0		0	2	
Missouri:											
Kansas City	1		0	1	5	2	0	4	3	7	73
St. Joseph	0		1	0	2	0	0	0	0	0	25
St. Louis	2			10	2	4	0	15	7	18	193
North Dakota:											
Fargo	1		0	1	0	0	0	0	0	0	10
Grand Forks	0		0	1	0	0		0	0	0	0
South Dakota:											
Aberdeen	0		0	0	0	0	0	0	0	2	0
Nebraska: Omaha	0		1	3	5	1	0	0	0	16	51
Kansas:											
Topeka	0		0	1	0	1	0	0	0	0	
Wichita	0		0	0	0	1	0	0	0	14	23
Delaware:											
Wilmington	0		0	0	0	0	0	1	0	4	42
Maryland:											
Baltimore	0		0	0	11	10	0	11	5	76	231
Frederick	0		0	0	0	0	0	0	0	0	3
District of Col.:											
Washington	8	0	0	2	7	7	0	13	2	12	156
Virginia:											
Lynchburg	0		0	4	0	0	0	0	0	19	11
Norfolk	0		0	0	3	0	0	2	1	0	34
Richmond	0		0	0	1	1	0	1	0	0	55
Roanoke	0		0	0	0	1	0	0	0	0	14
West Virginia:											
Charleston	0		0	0	2	0	0	0	2	2	19
Huntington	0		0	0	0	2	0	0	0	0	0
Wheeling	0		0	0	0	0	0	0	[1] 4	3	16
North Carolina:											
Raleigh	0		0	0	0	1	0	0	0	2	18
Wilmington	0		0	0	0	1	0	1	1	0	12
Winston-Salem	7	1	0	2	1	3	0	1	0	2	15

[1] Two nonresidents.

City reports for week ended Aug. 5, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
South Carolina:											
Charleston	0		1	0	1	0	0	1	4	0	25
Columbia	0		0	0	0	0	0	0	0	0	0
Greenville	0		0	0	1		0	0	0	0	9
Georgia:											
Atlanta	7	3	0	1	3	2	0	4	1	6	0
Brunswick	0		0	0	1	0	0	0	0	0	4
Florida:											
Miami	0		0	0	2	0	0	0	0	2	24
Tampa	1		0	0	1	0	0	0	0	0	25
Kentucky:											
Ashland	0		0	0	0	0	0	0	2	0	0
Lexington	0		0	0	0	0	0	1	8	0	22
Louisville	0	1	0	0	3	1	0	2	3	6	63
Tennessee:											
Memphis	1		0	11	1	2	0	7	8	9	90
Nashville	0		0	2	0	3	0	0	8	9	47
Alabama:											
Birmingham	3		1	0	4	1	0	7	7	4	68
Mobile	0		0	0	0	1	0	0	0	0	28
Montgomery	0	1		0		0	0		0	5	
Arkansas:											
Fort Smith	0			0		1	0		0	0	
Little Rock	0		0	0	2	0	0	3	[2] 1	0	6
Louisiana:											
New Orleans	5	1	1	0	9	5	0	14	7	1	156
Shreveport	0		0	0	4	0	0	3	0	0	
Oklahoma:											
Tulsa	0			1		1	0		0	6	
Texas:											
Dallas	2		0	0	0	0	0	1	4	10	51
Fort Worth	2		0	0	0	0	0	1	1	0	27
Galveston	0		0	0	0	0	0	0	0	0	8
Houston	3		1	2	4	0	0	4	1	0	81
San Antonio	0		1	1	2	0	0	2	0	0	49
Montana:											
Billings	0		0	0	0	0	0	0	0	0	6
Great Falls	0		0	0	0	1	0	0	0	10	3
Helena	0		0	0	0	0	0	0	0	0	3
Missoula	0		0	0	0	0	0	0	0	0	6
Colorado:											
Denver	0		0	3	3	2	0	5	0	16	77
Pueblo	0		0	0	0	0	0	1	1	5	10
New Mexico:											
Albuquerque	0		0	0	0	0	0	2	0	6	13
Utah:											
Salt Lake City	0		1	14	0	2	0	1	2	15	24
Nevada:											
Reno	0		0	0	0	0	0	0	0	0	8
Washington:											
Seattle	0		1	1	2	5	1	4	2	21	75
Spokane				6				1			20
Tacoma	0		0	0	2	0	0	0	0	5	21
Oregon:											
Portland	0		0	2	3	4	3	1	0	1	55
Salem	0		0	0	0	1	0	0	0	0	0
California:											
Los Angeles	7	5	1	22	9	11	13	20	0	72	218
Sacramento	0		0	0	0	0	0	4	1	5	30
San Francisco	3		1	2	2	4	0	6	0	10	110

[2] Nonresident.

City reports for week ended Aug. 5, 1933—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Missouri:			
Boston	0	1	12	St. Louis	0	0	1
Worcester	0	0	3	North Dakota:			
New York:				Fargo	0	0	1
New York	1	1	60	District of Columbia:			
New Jersey:				Washington	1	0	0
Camden	0	0	1	South Carolina:			
Newark	0	0	1	Greenville	0	1	0
Pennsylvania:				Georgia:			
Philadelphia	0	0	2	Atlanta	0	0	1
Pittsburgh	0	0	8	Tennessee:			
Ohio:				Nashville	0	0	1
Cleveland	0	0	1	Louisiana:			
Indiana:				New Orleans	0	0	2
Indianapolis	2	0	0	Texas:			
Illinois:				Houston	0	0	1
Chicago	4	0	4	Oregon:			
Michigan:				Portland	0	0	1
Detroit	0	0	1	California:			
Minnesota:				Los Angeles	0	0	1
Duluth	1	0	1	Sacramento	0	0	1
Iowa:							
Des Moines	1	0	0				
Sioux City	2	0	1				

Lethargic encephalitis.—Cases: Hartford, 1; Newark, 1; Cleveland, 1; Detroit, 1.
Pellagra.—Cases: Charleston, S.C., 1; Montgomery, 1; New Orleans, 2.
Typhus fever.—Cases: New York, 1; Norfolk, 2; Wilmington, N.C., 2; Charleston, S.C., 1; New Orleans, 1; Tampa, 1.

FOREIGN AND INSULAR

DENMARK

Communicable diseases—April–June 1933.—During the months of April, May, and June, 1933, cases of certain communicable diseases were reported in Denmark as follows:

Disease	Cases		
	April	May	June
Cerebrospinal meningitis	6	10	4
Chicken pox	45	50	30
Diphtheria and croup	148	118	116
Dysentery (amebic)		1	
Erysipelas	208	209	207
German measles	37	103	73
Gonorrhea	690	741	862
Influenza	5, 526	3, 379	2, 048
Lethargic encephalitis	7	6	4
Measles	1, 435	1, 223	720
Mumps	622	686	511
Paratyphoid fever	12	13	15
Poliomyelitis	1		
Puerperal fever	14	12	18
Scabies	628	484	413
Scarlet fever	137	176	217
Syphilis	64	59	79
Tetanus	1	4	4
Typhoid fever	1	2	4
Undulant fever (Bact. abort Bang)	55	59	57
Whooping cough	1, 034	1, 275	1, 080

ITALY

Communicable diseases—4 weeks ended April 2, 1933.—During the 4 weeks ended April 2, 1933, cases of certain communicable diseases were reported in Italy as follows:

Disease	Mar. 6–12		Mar. 13–19		Mar. 20–26		Mar. 27–Apr. 2	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	8	8	9	9	13	12	11	9
Cerebrospinal meningitis	14	13	17	11	9	8	19	16
Chicken pox	302	102	472	133	270	81	350	102
Diphtheria and croup	517	300	631	365	465	263	545	321
Dysentery	4	4			4	4	3	2
Lethargic encephalitis	2	2	1	1	2	2	3	3
Measles	1, 227	219	1, 471	240	1, 133	215	1, 692	251
Poliomyelitis	4	4	6	6	8	7	7	7
Scarlet fever	295	105	338	125	288	115	357	124
Typhoid fever	162	100	218	129	165	103	211	143

JAMAICA

Communicable diseases—4 weeks ended April 22, 1933.—During the 4 weeks ended April 22, 1933, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island of Jamaica, outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox	6	19	Leprosy	1	3
Diphtheria		4	Puerperal fever		1
Dysentery	16	12	Tuberculosis	30	64
Erysipelas		3	Typhoid fever	18	69

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Jan. 8–Feb. 4, 1933	Feb. 5–Mar. 4, 1933	Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Week ended— May 1933, 6	May 13	May 20	May 27	June 1933, 3	June 10	June 17	June 24	July 1933, 1	July 8	July 15	July 22	July 29	Aug. 5, 1933
China:																			
Canton	C														1				
Hankow	C						1		1			1							
	D						1												
Swatow	C						2												
Tientsin	C													2	2				
India	C	3,396	3,171	7,878	11,095	2,628	2,058	1,964	1,551	1,155	729	785							
	D	1,721	5,170	3,852	5,655	1,310	1,011	991	779	463	331	362							
Bombay	C	1	1		1			1	1				1	1	1	2	1		
Calcutta	C	110	114	327	770	186	192	188	124	78	60	22	36	14	24	14	7		
Chittagong	C		1	5	16	10	8	2	1	1		4	2						
Colong	C				1														
Moulmein	C										2		1						
Rangoon	C				1			1					1			2			
Vizagapatam	C								1									4	
India, French: Chandernagor	C	1	2																
Indo-China (see also table below):																			
Pnom-Penh	C			1				1	1	1									
Saigon and Cholon	C	2		1	4									3	3	1	1		
Plague-infected rats							3												
Philippine Islands:																			
Bohol Province	C								15	40	14	13	13						
	D								12	20	9	7	2						
Tagbilaran	C																		1
Cebu Province [1]	C		17	2						1		1							
Cebu	C												1						
	D												1						
Opon	C														6	29	37	8	4
	D														2	8	16	6	5

Santa Fe	C													2		4	1		
	D													2		1	2		
Toledo	C																3		
	D																2		
Iloilo Province—Iloilo	C					1										1			
	D					1										1			
Leyte Province	C	110	78	26	50	9		9	4		2								
	D	76	56	24	46	8		8	4		2								
Occidental Negros Province	C												19						
	D												9						
San Carlos	C													5	1				
	D													6	1				
Pampanga Province	C								1										
	D								1										
Rizal Province	C					1													
Samar Province	C	121		[2] 186	67			29				3	4						
	D	75		[2] 144	50			23				3	2						
Siam:																			
Bangkok	C	1				1					1								
Provinces	C				1				13	5	10	7	5		1				
	D								6	1	6	2	4		1				
On vessel: S.S. Dunana at Madras	D								1										

Place		January 1933			February 1933			March 1933			April 1933			May 1933			June 1933		
		1–10	11–20	21–31	1–10	11–20	21–28	1–10	11–20	21–31	1–10	11–20	21–30	1–10	11–20	21–31	1–10	11–20	21–30
Indo-China (French) (see also table above):																			
Cambodia [3]	C				9		1		2	2	5		4	11	14	17	23	31	14
	D				6		1		1	2	5		2	8	10	9	12	17	6
Cochin-China [3]	C	1	4	2	9	2	1	8	4	2	2	7	1	5	9	6	4	8	5
	D	1	1		6	2	1	7	3	2	2	7	1	4	8	6	4	8	4

[1] During the week ended Aug. 12, 1933, cholera was reported in Cebu Province, Philippine Islands, as follows: Maytan Island, 1 case; Olango Island, 6 cases, 3 deaths; Opon, 1 case, 1 death; Santa Fe, 6 cases, 4 deaths.

[2] For the month of March 1933.

[3] Reports incomplete.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE[1]

[C indicates cases; D, deaths; P, present]

Place		Jan. 8–Feb. 4, 1933	Feb. 5–Mar 4, 1933	Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Week ended— May 1933: 6	13	20	27	June 1933: 3	10	17	24	July 1933: 1	8	15	22	29
Angola	C		P															
Argentina:[2]																		
Cordoba Province	C	1	5	5	1				8									
Jujuy Province	C	10	6															
Rosario	C			2														
San Luis Province	C				7													
Belgian Congo	C				P													
Bolivia: Tomina Province	C		P		P													
British East Africa (see also table below):																		
Kenya	C										3			2				
Tanganyika	D	2		1					1									
Uganda	C	58	40	44	48	14	24	25	22	17	23		13	14				
	D	58	40	44	48	14	24	24	21	16	24		13	14				
Ceylon:																		
Colombo	C	7	10	2	1							1		1	1			
	D	7	7	2								1		1	1			
Plague-infected rats			4											2	1	1		
Provinces	C	17	1	28														
	D	11	1	26														
Dutch East Indies:																		
Batavia	C			[3] 1														
West Java	C	1,329	1,152		1,013													
	D				498													
Ecuador. (See table below.)																		
Egypt:																		
Alexandria	C			1	1												2	2
Asyut	C	4	4	8	11	1	4	3	2	1		1						
Aswan	C				3	1												
Girga	C													1	1			
Minufiya	C			2	1	1												
Minya	C														1			

France: Marseille.[4]																		
Hawaii Territory:																		
Hawaii Island:																		
Hamakua—Kukaiau	C	1																
	D	1																
Plague-infected rats		7																
Paauilo—Plague-infected rats		1																
Maui Island—Makawao:																		
Plague-infected rats		1																
Omaopio—Plague-infected rats		1																
India	C	6,662	6,399	5,409	3,227	671	639	559	450	423	271	280						
	D	4,191	3,775	3,498	2,042	392	418	321	276	290	202	154						
Bassein	C	1	2	12	13	2	1			1				1	2	3	2	
Plague-infected rats		1	2	1	1		1	1	1	2				1		1		
Bombay	C		3	15	10	2	2	2		1		1					1	
Plague-infected rats		28	68	121	103	6	13	7	8	3	5	4	4	3	1			
Madras Presidency	C	508	378		27	11	6		6	8								
	D	170	173		14	3	3		2	6								
Rangoon	C	1	2				1						1					
Plague-infected rats		1	2	1											3			
Indo-China (see also table below):																		
Pnom-Penh	D	1	1	1	3		1	3	2	2		1	2	1				1
Saigon and Cholon	C	1			4		1		1					1	1			2
Iraq:																		
Baghdad	C		3				2		1	1			1	3	[3] 1	[3] 1	1	1
Basra	C													3				
Madagascar. (See table below.)																		
Morocco	C		4	33	28	2								5	2	1		
Peru. (See table below.)																		
Senegal. (See table below.)																		
Siam:																		
Bangkok	C				2													
Provinces	C	7	16	11							1		1					
South-West Africa: [5]																		
Straits Settlements: Singapore	C				2													
Syria: Beirut	C				1							1				2		
Union of South Africa: Orange Free State	C	4	1			1	1	3	2									
United States: California—San Benito County—Plague-infected ground squirrels		1																
On vessel: S.S. Kingsborough at port in Argentina	C			1														

[1] Including plague in the United States and its possessions.
[2] For the month of July 1933, 7 cases of plague with 3 deaths were reported in El Mollar, Salta Province, Argentina.
[3] Imported.
[4] During the week ended Aug. 12, 1933, 3 cases of plague with 3 deaths and 2 plague-infected rats were reported in Marseilles, France.
[5] 63 cases of plague with 5 deaths were reported in Ovamboland, South-West Africa from Jan. 1 to June 17, 1933. Antiplague measures have been taken.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		January 1933	February 1933	March 1933	April 1933	May 1933	June 1933
British East Africa (see also table above): Kenya	C	6	11	6	6	4	6
Ecuador	C	1		3		35	
Indo-China (see also table above):							
Cambodia	D	2	3	7	6	3	5
Cochin-China	C	1	1	2	5	2	
Madagascar:							
Province:							
Ambositra	C	158	161	155			
	D	146	149	154			
Antisirabe	C	63	72	63			
	D	61	72	62			
Fianarantsoa	C		46	64			
	D		42	63			
Maevatanana	C	2	6	8			
	D	2	5	7			
Madagascar—Continued							
Province—Continued							
Miarinarivo	C	75	8	9			
	D	14	8	9			
Moramanga	C	163	23	48			
	D	159	23	46			
Tamatave	C			1			
	D			1			
Tananarive	C	198	219	175			
	D	190	207	168			
Peru	C	4	18	7	2	3	
Senegal:							
Dakar [1]	C	2	4	1	1	2	
	D	2	4		1	1	
Tivaouane [1]	C				1		1

[1] Reports incomplete.

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Jan. 8–Feb. 4, 1933	Feb. 5–Mar. 4, 1933	Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Week ended— May 1933 6	May 13	May 20	May 27	June 1933 3	June 10	June 17	June 24	July 1933 1	July 8	July 15	July 22	July 29
Algeria:																		
Algiers Department	C														2			
Constantine Department	C			1													1	
Arabia:																		
Aden	C	2	1															
Muscat—Oman Sultanate	C									44		29						
	D									11		9						
Argentina: Chaco Territory	C		P															
Belgian Congo	C														2	3		
	D														1			
Bolivia	C		39	21														
Brazil: Porto Alegre (alastrim)	C	1																
British East Africa:																		
Kenya	C		14	23	13	4												
Tanganyika	C	95	56	43	17			11	2	8			2					
British South Africa:																		
Northern Rhodesia	C		1	21					2									
Southern Rhodesia	C	25	22		8													
Canada:																		
British Columbia	C				[1] 6			[1] 1		[1] 1								
Ontario	C			5				[1] 1		[1] 1								
Toronto	C				[1] 3	1												
Saskatchewan	C	5	31	14	[1] 2			[1] 5		[1] 1								
Ceylon:																		
Colombo	C	75	34	4	2	4					1	2	6	3				
Galle	C				46	2												
China:																		
Amoy	C	1	5	4	3			2	1	1		1						
Canton	C	504	234	67	50	3	3	1										
	D	13	1		2													
Chemulpo	C		17															
Dairen	C	4	5	5	1			2	1		2							
Foochow	C	P	P	P	P		P				P		P		P			
Hangchow	C														3			
	D														2			
Hong Kong	C	78	169	169	84	6	8	3	2	3	2	2	1	1	1	1		

[1] For 2 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Jan. 8–Feb. 4, 1933	Feb. 5–Mar. 4, 1933	Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Week ended— May 1933 6	May 13	May 20	May 27	June 1933 3	June 10	June 17	June 24	July 1933 1	July 8	July 15	July 22	July 29
China—Continued.																		
Macao	C	3	8	11	4	4												
Nanking	C	38	89	16	2		1		1		1		1	1				
Shanghai	C	41	28	38	39	4	12	8	9	3	6	12	6	3	10	3		3
Swatow	C	22	21	26	16	4		3	3	3	1							
Tientsin	C									10	3	1	2	1	1			
Chosen. (See table below.)																		
Dahomey	C	22	32		26	2	9											
Dutch East Indies	C	1																
Ecuador. (See table below.)																		
Egypt:																		
Alexandria	C	1,204	943	277	42	3	3		5									
Beheira	C	21	80	132	114	41	5	13	3	4	1	1						
Cairo	C	37	25	16	10	2	4	1	3	1	2		1	1				
Gharbiya	C	39	48	74	88	32	17	19	25	46	40	26	30	18	16			
Minufiya	C	12	40	35	37	26	41	47	14	15	8	2	1					
Port Said	C	5	1	6	3													
Suez	C	3	4	3														
Provinces	C	96	211	284	309	75	83	125	64	82	8	56	69	137	122	111		
France. (See table below.)																		
Great Britain:																		
England and Wales	C	66	76	71	98	23	22	30	16	27	18	18	8	14	15		4	7
London	C	59	66	62	75	20	18	27	14	17	16	12	6	12	12	9	2	5
London and Great Towns	C	66	75	66	85	20	18	29	15	17	17	15	7	13	13	14	3	6
Greece (see also table below): Salonika	C					6		6	6						2	2		
Guatemala. (See table below.)																		
Honduras:																		
Puerto Castilla	C			2														
Tegucigalpa	C			14	1		7			3								
Tela	C	4	6	3	1													
India	C	20,423	31,824	34,938	40,379	8,775	8,505	8,861	7,735	7,015	5,905	6,001						
	D	5,907	8,303	8,391	10,288	2,576	2,415	2,391	2,324	2,055	1,747	1,783						
Bassein	C		7	13	57	11	2	7	12	4	4	6	2		2	4		
	D		2	5	14	3	5	1	2	3	4	4		1	1	4		

Bombay	C	805	1,522	1,175	510	69	52	44	47	34	18	20	16	14	8	5	2	
	D	391	795	717	286	55	35	28	30	22	14	12	10	10	4	5	2	
Calcutta	C	961	1,637	1,520	921	118	82	81	61	53	35	25	21	20	13	6	7	
	D	672	1,147	1,053	745	97	72	74	46	45	23	19	20	16	10	3	7	
Chittagong	C							1										
	D							1										
Cochin	C			4	5						1		1	1				
Karachi	C	45	47	115	130	11	13	18	10	4	10	3	2	3	4	4	3	
Madras	C	351	564	666	496	66	67	60	38	36	29	31	48		61	39	71	
Moulmein	C		1								12							
Negapatam	C	3	2	4	6	4		1	2	1	1	1			4	1	2	
Rangoon	C	5	20	11	15	1	6	2	8	3	1	2		2		13	1	
Tuticorin	C				1													
Vizagapatam	C			5	4	1		1		1	1	1	2	2	4	1	1	
Indo-China (see also table below): Saigon and Cholon	C		3	7	2												1	
Iraq:																		
Baghdad	C	8	4	2	2	3		1	1									
Basra	C	6	3	2		5		1		2								
Ireland: Belfast	C		1															
	D		1															
Japan:																		
Kobe	C			5										1				
Nagoya	C		1															
Osaka	C		3	4	8				1									
Tokyo	C			2	6		1			1		1		27	11			
Yokohama	C				3													
Mexico:																		
Coahuila	C		1						1	1			1					
Juarez	C		3		5				2									
Mexico, D.F.	C	10	5	6	11		2	1	2		2	3			1			
Monterrey	D								2									
Saltillo	D	4	4	3	1	1	1					2	1					
San Luis Potosi	D				1	2	1		2			1		1	2	2	2	2
Morocco. (See table below.)																		
Nigeria	C	401	1,878	562	1,261		5		164									
Palestine	C														9	4		
Persia	C	108	29	26	54	22	30	37		15	16							
	D	41	4	4	23	5	21	36		45	17							
Peru. (See table below.)																		
Poland	C					1		1					1					1
Portugal:																		
Lisbon	C	4	4	2	2		1		1		1	2		1	2		2	
Oporto	C	5	5	2				1	1					1		1		1
Siam: Bangkok	D	2	2	4														
Sierra Leone	C	217	36	63	22		18		33		6							
Sudan (Anglo-Egyptian)	C	57	34	32	18	3			2	1					1	3	1	
Syria:																		
Beirut	C	8	15	16	2	1					5	1		1	1	7	3	2
Provinces	C	66	34	25	40	7	7	2	4		1		3	6		3		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Jan. 8–Feb. 4, 1933	Feb. 5–Mar. 4, 1933	Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Week ended— May 1933 6	13	20	27	June 1933 3	10	17	24	July 1933 1	8	15	22	29
Turkey. (See table below.)																		
Union of South Africa:																		
Cape Province	C		P	P		P	P											
Orange Free State	C		P	P	P					P	P							
Transvaal	C	P																
Zanzibar	C		2															
On vessels:																		
S.S. Amassis at Alexandria	C	1																
S.S. Somersetshire at Suez	C	1																
S.S. Volturno at Alexandria	C		1															
S.S. Arimondi at Massaoua	C		2															
S.S. Hatasu at Malta	C			1														
S.S. Talma at Hong Kong	C		1															
S.S. Karapara at Rangoon	C		1															
S.S. Nawab at Rangoon	C	1																
S.S. California at Liverpool	C			1														
S.S. Kalgan at Bangkok from Swatow	C			1														
S.S. Nordland at Alexandria	C			1														
S.S. Hong Kheng at Rangoon	C		1															
S.S. Hiram at Bangkok	C			1														
S.S. Arunda at Rangoon from Calcutta	C			1														
S.S. Haiching at Amoy	C			1														
S.S. City of Nagpur at Karachi	C				1													
S.S. Rajputana at Aden	C						1											
	D						1											
S.S. Baron Inchcape at Hong Kong	C						P											
S.S. Fernmoor at Vancouver	C										4							

Place		January 1933	February 1933			March 1933			April 1933			May 1933			June 1933	
			1-10	11-20	21-28	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20
Indo-China (see also table above)	C	253	29	98	60	167	83	120	107	159	163	58	48	43	60	82
	D	58	16	33	28	55	30	45	31	30	50	21	14	10	16	36

Place		January 1933	February 1933	March 1933	April 1933	May 1933	June 1933
Chosen	C	7	17	30	4	34	
	D	1	5	7	2	14	
Ecuador	C					[1] 1	
France	C	19	20	23	15	21	
Greece	C		3	4	6		
Guatemala	C				3	1	
Morocco	C	14	14		23	14	10
Peru	C	38	6	7			
Turkey	C	5		1	3		

[1] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Jan. 8–Feb. 4, 1933	Feb. 5–Mar. 4, 1933	Mar. 5–Apr. 1, 1933	Week ended— April 1933				May 1933				June 1933				July 1933			
					8	15	22	29	6	13	20	27	3	10	17	24	1	8	15	22
Algeria:																				
Algiers Department	C	1	1	3			1	1	7	2	2	3	4			7	1		1	2
Constantine Department	C	6	71	107	3	36	95	85	52	41	16	11	40	34	38	45	18	20	3	14
Bone	C		1	2			3		1	1										
Oran Department	C												1				1	1		
Argentina: Buenos Aires	C	6																		
Basutoland. (See table below.)																				
Bolivia. (See table below.)																				
British East Africa: Uganda	C	17	19	12						2	8		2	2	1	2	1			
Bulgaria	C	2	9	48		9			8					4				1		1
Chile [1]	C	152	133	102	34	33	37	33												
Antofagasta	C	1	1			1									1					
Santiago	C			1					34	30	29	41	33	85	74					
Valparaiso	C															1		1		
China:																				
Hankow	C	3	5																	
Nanking	C																	1		
Shanghai	C																	1		
Tientsin	C																	1		
Czechoslovakia. (See table below.)																				
Egypt:																				
Alexandria	C	1					6		6	7	4	7	5		4	3	9	2	3	1
Beheira	C	128	174	184	74	175	61	133	163	146	131	120	226	111	138	94	42			
Cairo	C		3	4	1	10	19	12	14	15	12	12	9	12	7		1	1	3	2
Dakahliya	C	35	84	196	80	28	76	47	49	71	86	61	47	24	46	23	43			
Damietta	C												1					1	2	
Gharbiya	C	111	190	378	62	54	99	116	96	118	105	129	185	132	133	141	97			
Provinces	C	320	492	922	273	292	332	348	388	446	402	375	568	341	381	301	242	199		
Greece. (See table below.)																				
Guatemala. (See table below.)																				
Hungary	C	3	26	5	3		2	9	3	3	4	5	7		2	2				
Iraq: Baghdad	C			1			1			1		1	1		1					
Ireland: Belfast	C		1																	
Lithuania	C	49	44	35	5	6	8	8	12	7	4	8	1	5	8	1				

Mexico:																				
Mexico, D.F	C	2	11	14	--	--	2	2	4	3	5	3	7	2	--	--	--	2	1	--
San Luis Potosi	D	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Morocco	C	63	138	46	3	6	6	2	6	10	8	7	19	17	19	8	--	4	--	8
Palestine	C	1	2	3	1	--	1	1	--	--	--	--	--	--	--	1	18	--	--	--
Persia	C	16	40	28	19	18	13	19	24	10	5	--	7	6	8	4	6	--	--	--
Peru. (See table below.)																				
Poland	C	277	350	335	92	87	73	103	100	98	98	82	96	76	75	75	61	44	38	20
	D	26	20	20	8	6	9	1	3	8	4	6	2	5	2	4	3	2	2	1
Rumania	C	219	276	278	67	65	41	65	68	74	64	62	40	36	--	21	--	--	--	--
Syria [2]	C	--	--	--	--	--	--	--	7	1	11	5	18	2	--	1	1	--	--	--
Trans-Jordan	C	--	2	13	3	1	4	--	6	6	1	4	2	2	--	--	--	--	1	1
Tunisia:																				
Tunis	C	--	1	1	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Provinces	C	37	34	48	6	17	26	3	10	3	20	9	12	36	5	12	--	20	6	10
Turkey (see also table below): Istanbul	C	5	1	4	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Union of Socialist Soviet Republics. (See table below.)																				
Union of South Africa. (See table below.)																				
Yugoslavia. (See table below.)																				
On vessels:																				
S.S. Munplace at New Orleans from Progresso	C	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S.S. Chiloe at Antofagasta	C	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--
S.S. Conte Verde at Bombay from Singapore	C	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--

Place		January 1933	February 1933	March 1933	April 1933	May 1933	June 1933
Basutoland	C	29	44	37	93	233	--
Bolivia	C	29	33	72	190	98	--
Czechoslovakia	C	--	13	9	--	--	--
Greece	C	10	2	3	3	12	6
Guatemala	C	6	9	11	14	8	3
Peru	C	81	--	41	21	28	--
Turkey (see also table above)	C	23	11	8	12	16	--

Place		January 1933	February 1933	March 1933	April 1933	May 1933	June 1933
Union of Socialist Soviet Republics	C	3,503	2,773	--	--	--	--
Union of South Africa:							
Cape Province	C	170	74	83	130	189	--
Natal	C	40	15	1	8	6	--
Orange Free State	C	25	16	22	45	15	--
Transvaal	C	--	--	3	1	1	--
Yugoslavia	C	35	125	12	--	--	136

[1] Up to July 31, 1933, 5 cases of typhus fever were reported in Aconcagua Province, Chile, outside the city of Valparaiso. From July 24 to 31, 1933, 8 cases of typhus fever were reported in the city of Valparaiso, Chile.

[2] Under date of May 1, 1933, an epidemic of typhus fever was reported in Syria, in the Deir-el-Zor District.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		Jan. 8–Feb. 4, 1933	Feb. 5–Mar. 4, 1933	Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Week ended— May 1933 6	May 13	May 20	May 27	June 1933 3	June 10	June 17	June 24	July 1933 1	July 8	July 15
Brazil:																
Ceara State:																
Araripe	C		2													
	D		2													
Limoeiro	C				1											
	D				1											
Pernambuco State.[1]																
French West Africa: Guinea	C	1														
	D	1														
Gold Coast	C		2			1		1					1			
	D		2													
Guinea (Portuguese): Bissagos Islands	C	44														
	D	14														
Ivory Coast:																
Bouafle	C												1			
Gagnoa	C											[2] 1				
	D											1				
Senegal:																
Bakel	C			1												
Dagana	C			1												
	D			1												
Podor	C			1												
St. Louis	D															[3] 1

[1] 1 case of yellow fever with 1 death was reported in Pernambuco State, Brazil, during June 1933.
[2] Suspected.
[3] Imported case.

X

UNITED STATES TREASURY DEPARTMENT

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A Note on Epidemic Encephalitis in St. Louis, Missouri
The Incidence of Endemic Goiter in Northeastern Germany
Experimental Feeding of Ticks on Guinea Pigs and Rabbits
Deaths in Large Cities During the Week Ended August 12
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 48 SEPTEMBER 1, 1933 NO. 35

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES[1]

July 16–August 12, 1933

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease."

Poliomyelitis.—The number of cases of poliomyelitis increased from 188 for the 4 weeks ended July 15 to 667 for the current 4-week period. In Massachusetts the number of cases rose from 36 to 92; in New York from 25 to 245; in New Jersey from 4 to 18; in Pennsylvania from 10 to 44; in Ohio from 9 to 28; in Illinois from 13 to 27; in Minnesota from 6 to 35; in West Virginia from 3 to 21; in Tennessee from 10 to 35.

All areas contributed to the increase, but the most appreciable increases were reported from the same regions in which the disease first appeared in epidemic form in 1931. With the exception of the rise in Tennessee, the South Central as well as the Far Western States have reported no more than the usual seasonal prevalence. The epidemic of 1930 appeared first in those regions.

For the country as a whole the number of cases (667) was 1.7 times that reported for the corresponding period last year but it was only about one fifth of the number reported in 1931. For this period in 1930 and 1929 the numbers of cases were 897 and 314, respectively.

Considering the situation in geographic areas, there were in the New England and Middle Atlantic States more than twice as many cases reported for the current period as for the corresponding period

[1] From the Office of Statistical Investigations, U.S. Public Health Service. The numbers of States included for the various diseases are as follows: Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 47; diphtheria, 48; scarlet fever, 48; influenza, 38 States and New York City. The District of Columbia is counted as a State in these reports.

These summaries include only the eight important communicable diseases for which the Public Health Service receives regular weekly reports from the State health officers. Items on lethargic encephalitis in St. Louis are printed on pp. 1071 and 1088.

of last year. The 411 cases were, however, only about one sixth of the number recorded for this period in 1931.

In the East North Central States the number of cases (66) was approximately the same as last year. There were 211 in 1931.

In the West North Central the current incidence (73 cases) represented a 100 percent increase over last year but it was approximately the same as in 1931. The epidemic of 1930 made its appearance in this region during this period and the number of cases reported in that year (122) is the highest in that region for the corresponding period in the 5 years for which data are available.

In the South Atlantic States the incidence was about normal for the current period. This region was not greatly affected by either of the recent epidemics. There was a rather high incidence of the disease in that area during this period in 1929.

In the South Central and Mountain and Pacific areas the present incidence follows very closely the average for the years 1929, 1931, and 1932. In those areas the 1930 epidemic reached its peak during this period.

Typhoid fever.—The usual seasonal increase of typhoid fever continued through the current 4-week period. Each geographic area contributed to the increase but the disease seemed to be most prevalent in the South Central regions. For the country as a whole, the number of cases reported (3,735) was only about 77 percent of the number for the corresponding period last year, but it was slightly higher than in any of the 3 preceding years.

Smallpox.—The incidence of smallpox dropped about 50 percent during the current 4-week period as compared with the preceding 4 weeks. The number of cases (200) was only about 65 percent of last year's figure. For this period in the years 1931, 1930, and 1929 the numbers of cases totaled 652, 1,394, and 1,349, respectively. Only one region, the South Atlantic, reported an increase over last year. The greatest decrease was reported from the West North Central group of States. During the entire current year the smallpox incidence has averaged only about 60 percent of that of last year.

Influenza.—For the 4 weeks ended August 12 there were 976 cases of influenza reported, as compared with 987, 832, and 525 for the corresponding period in the years, 1932, 1931, and 1930, respectively. A survey of geographic areas shows that a very favorable situation exists in all parts of the country.

Scarlet fever.—The number of cases of scarlet fever reported for the current period (4,068) was practically the same as that for the corresponding period last year. For this period in the years 1931, 1930, and 1929 there were reported 3,362, 2,962, and 4,118 cases, respectively. In each geographic area the current incidence followed the trend of last year very closely. Since the beginning of the present

year, the scarlet fever incidence has very closely approximated that of last year.

Diphtheria.—The incidence of diphtheria remained at the low level that has characterized it throughout the present year. The number of cases reported for the 4 weeks ended August 12 was 1,773, as compared with 2,170, 1,997, and 2,344 for the years 1932, 1931, and 1930, respectively. For this period in 1929 the number of cases was 3,520. All sections have shared in the favorable decline. Only the South Atlantic and South Central areas have at any time during the current year reported an increase over last year during any 4-week period, and there the increases have been slight.

Meningococcus meningitis.—The meningococcus meningitis situation continued very favorable during the current period. The number of cases reported (147) was the lowest recorded for this period in the 5 years for which data are available. The incidence in the East and West North Central geographic areas is the lowest in the 5-year period; in other areas the current cases approximated the average of recent years.

Measles.—There was a decrease of approximately 13,000 in the number of cases of measles during the current 4-week period as compared with the preceding 4 weeks. The number of cases reported (6,470) was about 85 percent of the number reported for the corresponding period last year and 90 percent of the average for the 3 preceding years. The disease was most prevalent in the South Central and Mountain and Pacific areas. In the South Central areas the number of cases (819) was eight times that for last year for the same period, and in the Mountain and Pacific areas the number (968) was twice that for last year. In the East North Central States, where the disease was unusually prevalent at this time last year, 730 cases were reported this year, as compared with 2,006 last year.

Mortality, all causes.—The average mortality rate from all causes in large cities as reported by the Bureau of the Census for the current period was 9.8 per 1,000 population (annual basis). The rate closely approximated that for last year (9.7), but it is still considerably below that for previous years for which data are available.

A NOTE ON EPIDEMIC ENCEPHALITIS IN ST. LOUIS

From Aug. 7 to 24, inclusive, there were reported in the metropolitan area of St. Louis 213 cases of epidemic encephalitis with 28 deaths, a case fatality rate of 13 percent.[1] Some of the cases date back to the latter part of July for their onset. Cases of apparently the same infection have been reported from other cities in Missouri and in neighbor-

[1] Later reports will be found on p. 1088.

ing States, but it is to be remembered that so-called epidemic, or lethargic, encephalitis and encephalitis not otherwise designated have a yearly incidence throughout the entire United States similar in magnitude to poliomyelitis as judged from mortality statistics, usually without the marked seasonal and yearly fluctuation of poliomyelitis.

Cases of lethargic encephalitis occur yearly in St. Louis, the heaviest preceding incidence having been in 1919, 1924, and 1932. Relatively fewer epidemics of this disease have been reported in the United States than in other parts of the world, the disease in the United States being apparently sporadic or endemic. Such outbreaks as have occurred in this country have been, as is usual elsewhere, in winter or early spring.

Preliminary data on age incidence show 19 percent of the cases among the 25 percent of the population which is under 15 years of age, with 10 percent case fatality in this age group. The incidence in this age group is about equally divided between those under and those over 10 years, but all 3 of the deaths in this group occurred in persons under 10. Twenty-one percent of the cases have been in the age group 15 to 34 years, which comprise 35 percent of the total population, and there has been only 3 percent case fatality in this age group. Thirty percent of the cases have been among the 27 percent of the population which is 35 to 54 years of age, with 20 percent case fatality. Another 30 percent of the cases have been among those over 55 years old, who comprise only 13 percent of the population, and the case fatality in this oldest age group has been 30 percent. In this respect also, as in seasonal occurrence, this outbreak differs from ordinary epidemic encephalitis, in which the maximum incidence tends to be in youth and the early adult years.

There have been about 83 cases in males to each 100 in females, while among the total population concerned there are 96 males to each 100 females. The excess in females has been in the ages over 35 years.

The symptomatology of the cases has differed somewhat from most other outbreaks of epidemic encephalitis in that disturbances of the motor functions of the eye are unusual, instead of being usual, and there is a more uniform, moderate meningeal involvement, with corresponding increase in the cell count on spinal puncture. The clinical picture is that of a general febrile disturbance, often with gastro-intestinal symptoms such as vomiting, constipation, or diarrhea; evidences of cerebral involvement—an apathetic or immobile facial expression, usually somnolence, stupor, coma, or delirium; usually a moderately stiff neck, with headache, which is often the first and most pronounced symptom, and other pains, as of the abdomen or legs; tremor and catatonic semirigidity are common in the more severe cases. Tendon reflexes, such as those of the elbow,

knee, ankle, and superficial reflexes, such as those elicited by stroking the abdomen, tend to be irregularly diminished or absent, and to vary from day to day. Not infrequently the plantar reflex is extensor, the toes coming up on the stroking of the outer side of the sole instead of bending down. There may or may not be a Kernig's sign. Some patients are very restless and have to be restrained. Irregular paralyses may occur, and hemiplegia, usually transient, is not uncommon. Many cases are less typical, but in the St. Louis area the doubtful cases are usually found to be positive by spinal puncture and further course, or by necropsy. The triad of symptoms is a febrile course, evidence of cerebral involvement, and mild meningeal signs. The duration of the febrile stage is irregular—the temperature may be normal in a few days. Probabilities as to sequelae cannot be stated at present. The milder cases which have recovered so far are apparently restored to good health.

Pathologically, the lesions are of the same nature as, but are at a higher level and are more diffused than, those in the usual cases of lethargic encephalitis. The cortex is involved, and there is no tendency toward special localization in the central system, such as the basal ganglia and the brain stem.

The outbreak which most closely approaches this is that which occurred on the western side of the Inland Sea in Japan in 1924, and was described by Kaneko and Aoki in 1928.[2]

The incubation period is uncertain; there are indications that it may be 5 to 12 days. The onset is usually fairly sudden, that is, covering not more than 1 to 3 days.

The suburban areas in St. Louis County surrounding the city of St. Louis have had a far greater prevalence of the disease than the city of St. Louis itself, but the city boundaries have not been changed since 1876, and much of the territory outside the city would correspond to the outlying wards of other cities.

The precautions advised in the prevention of the spread of the disease are, in general, those which are applicable in an epidemic of poliomyelitis of like intensity, including isolation of the patient for 3 weeks. Connected cases and cases in the same family are occurring about as frequently as in poliomyelitis. Two of the St. Louis patients had poliomyelitis 12 and 2 years ago, respectively. On account of the predominantly suburban incidence and the seasonal incidence it is also advised that the patients be screened. Drinking water as a major factor in the spread of the disease appears to be excluded.

[2] Ergebnisse der inneren Medizin und Kinderheilkunde, vol. 34, p. 342.

A NOTE ON THE INCIDENCE OF ENDEMIC GOITER IN NORTHEASTERN GERMANY

By ROBERT OLESEN, *Senior Surgeon, United States Public Health Service*

Thyroid surveys of comparable groups by identical procedure indicate that endemic goiter is more prevalent in certain parts of Germany than in Northern Ireland. It has been possible to make these observations during the course of routine physical examinations of applicants for immigration visas.

The present study, carried on while the writer was stationed in Berlin, included 1,976 males and 2,320 females of various ages. The

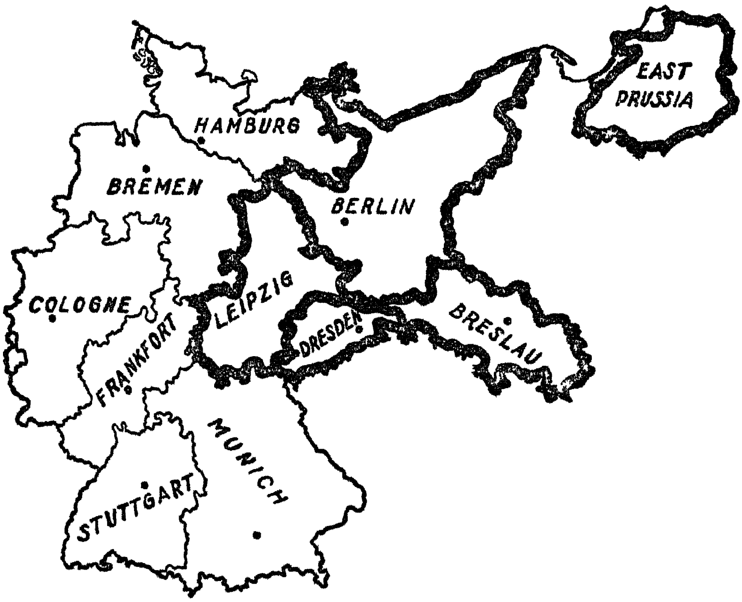


FIGURE 1.—Map showing the United States consular districts in Germany. Individuals included in this report came from the five districts shown here heavily outlined—Berlin, Leipzig, Dresden, Breslau, and East Prussia.

examinations were made between July 1, 1930, and November 1, 1931. The findings have been classified according to arbitrary standards employed on a large scale in the United States. It is possible then, to compare the results of thyroid studies made in the United States with similar studies conducted in Northern Ireland and a portion of Germany.

The individuals included in the present report were, at the time of the examinations, residents of the five consular districts of Berlin, Leipzig, Dresden, Breslau, and East Prussia. These districts are shown heavily outlined in figure 1, in order that their extent, position, and relationship to surrounding territory may be indicated. As this portion of Germany is in juxtaposition to much of Poland and Czechoslovakia, the goiter statistics for Germany may also be con-

sidered fairly representative of conditions in the adjoining sections of the bordering countries.

The method of examining and classifying thyroid enlargements in the United States has already been described in considerable detail.[1] The same procedure was employed during the examinations of applicants for visas in Germany.

RESULTS

In table 1 are shown the numbers, degrees, and percentages of the enlargements noted among the 1,976 males and 2,320 females examined. The ages of those examined ranged between 3 weeks and 91 years. Thus, 36 males and 53 females were under 5 years, while 83 males and 198 females were over 50 years of age. Larger numbers were included in the intermediate age groups.

The tabulation of results indicates that there were 326 definite thyroid enlargements among the males, a percentage incidence of 16.5. Of these 10.1 percent, while definite in character, were classified as very slight in size. Only 8 adenomatous goiters were found among the males. Among the 2,320 females there were 727 thyroid enlargements, a percentage of 31.3. Of these, 14.6 percent were classified as very slight, while 2.9 percent were definitely adenomatous in character.

In the three lower age groups, namely, from birth to 14 years, approximately the same incidence of thyroid enlargement appeared to prevail in both sexes. However, it is probable that the inclusion of greater numbers of children would have altered the result, making the affection somewhat more frequent among girls. The approximation of the incidence curves of both sexes indicates a considerable amount of endemic goiter in the general population. After the age of 15 the incidence of thyroid enlargement is consistently greater among the females of each age group.

TABLE 1.—*Numbers, degrees, and percentages of thyroid enlargement (by age groups) among 1,976 male and 2,320 female applicants for visas in Berlin, Germany*

1,976 MALES

Age group	With enlarged thyroids							Normal	Total
	Degree of enlargement					Total	Percent		
	Very slight	Slight	Moderate	Marked	Adenomatous				
Under 5	1					1	2.6	37	38
5 to 9	9	5			1	15	15.0	85	100
10 to 14	11	4				15	25.5	44	59
15 to 19	25	19				44	20.7	168	212
20 to 24	64	38	5	3	2	112	20.8	427	539
25 to 29	53	15	5		1	74	16.9	362	436
30 to 34	21	11	6		3	41	14.9	233	274
35 to 39	11	4				15	11.2	119	134
40 to 44	3	2	1			6	9.5	57	63
45 to 49	1				1	2	5.3	36	38
Over 50	1					1	1.2	82	83
Total	200	98	17	3	8	326		1,650	1,976
Percent	10.1	5.0	0.9	0.1	0.4		16.5		

[1] Endemic goiter. By Robert Olesen. Public Health Bulletin no. 192, p. 36. (1929).

TABLE 1.—*Numbers, degrees, and percentages of thyroid enlargement (by age groups) among 1,976 male and 2,320 female applicants for visas in Berlin, Germany*—Continued

2,320 FEMALES

Age group	With enlarged thyroids							Normal	Total
	Degree of enlargement					Total	Per-cent		
	Very slight	Slight	Moderate	Marked	Adenomatous				
Under 5	3					3	5.7	50	53
5 to 9	6	6				12	13.2	79	91
10 to 14	10	2			1	13	26.5	36	49
15 to 19	43	48	12		3	106	43.0	141	247
20 to 24	113	86	29	1	7	236	43.0	312	548
25 to 29	77	40	17	1	11	146	33.2	293	439
30 to 34	42	25	12	1	16	96	29.3	231	327
35 to 39	31	14	6		8	59	31.5	131	190
40 to 44	3	6	4		8	21	19.4	87	108
45 to 49	4	2	1		4	11	16.2	57	68
Over 50	7	4	2	1	10	24	12.0	176	200
Total	339	233	83	4	68	727		1,593	2,320
Per cent	14.6	10.1	3.6	0.1	2.9		31.3		

The statistical data are displayed graphically in figure 2. It will be seen that among boys the incidence of endemic goiter is greatest between the ages of 10 and 14 years. Thereafter there is a steady and regular decrease. Among females the incidence of goiter is highest between the ages of 15 and 24 years. After the age of 24 the goiter incidence among females is between 10 and 22 percent higher than among males of corresponding ages.

Adenomatous goiters.—Because of their potentialities for producing serious illness, the relative sizes of the 8 adenomatous goiters among the males and the 68 goiters of the same type among the females are shown in table 2. It will be noted that most of the enlargements were of definite and considerable size. Evidences of pronounced toxicity were apparent in 11 females and 1 male having adenomatous goiters.

During the examinations in Berlin, 3 females and 1 male were found to be suffering from Graves' disease. In three additional instances thyroidectomies had been performed at varying periods prior to the examinations without, however, relieving the symptoms of the disease. While the number of persons in the present series who were actually suffering from Graves' disease was comparatively small, it is believed that the disease is comparatively frequent in Germany; for frank cases are rather often seen in public.

TABLE 2.—*Degrees of thyroid enlargement among 8 males and 68 females with adenomatous goiters (by age groups) in northeastern Germany*

Age group	Males			Females					
	Very slight	Slight	Total	Very slight	Slight	Moderate	Marked	Very marked	Total
Under 5	1		1						
5 to 9									
10 to 14						1			1
15 to 19				2		1			3
20 to 24		2	2	2	3	2			7
25 to 29		1	1	3	5	2	1		11
30 to 34		3	3	3	6	5	2		16
35 to 39				1	4	3			8
40 to 44				2	4	2			8
45 to 49	1		1	2		2			4
Over 50				1	4	3	1	1	10
Total	2	6	8	16	26	21	4	1	68

Goiter and intelligence.—Additional observations were made for the purpose of determining whether a relationship exists between intelligence and thyroid status. Although many intelligence tests were applied and a number of mentally defective individuals were encountered, there was no evidence that thyroid enlargement or malfunction is commonly associated with mental inferiority. These conclusions support those previously reached during a special study of school children in Cincinnati, Ohio,[2] and also the observations made in Northern Ireland.[3]

Comparison of goiter incidence in Germany and Northern Ireland.—The results of a thyroid survey of applicants for immigration visas in Northern Ireland were presented in a previous article.[3] As the survey in northeastern Germany was made of similar groups by the same methods and one of the same examiners, it is interesting to compare the results obtained in these two countries. The percentage incidence of endemic goiter in Northern Ireland and northeastern Germany are shown in table 3. Except in a few minor details, the incidence in both sexes is definitely higher in Germany. Just why this should be so is a matter for speculation, as considerable areas of both countries are adjacent to the sea, and it might be expected that goiter would be relatively infrequent in its occurrence.

[2] Endemic goiter and intelligence. By Robert Olesen and Mabel R. Fernald. Pub. Health Rep., vol. 41, no. 21, pp. 971-986, May 21, 1926. (Reprint no. 1081.)

[3] A note on the incidence of endemic goiter in Northern Ireland. By Robert Olesen and Paul A. Neal. Pub. Health Rep., vol. 45, no. 44, pp. 2669-2672, Oct. 31, 1930. (Reprint no. 1422.)

TABLE 3.—*Percentage incidence of endemic goiter among male and female applicants for immigration visas (by age groups) in Northern Ireland and northeastern Germany*

Age group	Males		Females	
	Northern Ireland	North-eastern Germany	Northern Ireland	North-eastern Germany
Under 5	2.6	2.6	1.6	5.7
5 to 9	1.2	15.0	3.2	13.2
10 to 14	11.5	25.5	26.3	26.5
15 to 19	14.6	20.7	33.1	42.9
20 to 24	15.3	20.8	31.6	43.0
25 to 29	10.8	16.9	29.2	33.2
30 to 34	9.1	14.9	22.9	29.3
35 to 39	9.5	11.2	22.2	30.3
40 to 44	1.6	9.5	14.4	19.4
45 to 49	2.2	5.3	16.9	16.2
Over 50	.7	1.2	11.2	12.0
Percent of total number of applicants	11.8	16.5	27.4	31.3

The scope and value of thyroid surveys.—There has recently been considerable criticism of thyroid surveys, especially those confined to limited units of the population, such as school children. McCarrison [4] has so well defined the alleged defects of partial goiter surveys that his remarks on the subject may profitably be reproduced here and discussed briefly.

"Thyroid swellings in early life", says McCarrison, "are often purely physiological expressions of a healthy organ: in no less than 24 per cent of girls living in an iodine-rich and goitre-free locality the isthmus or the outline of the whole gland may be visible on deglutition. Such thyroids are often styled 'incipient goitres.' Partly because of their inclusion in goitre-surveys, but mainly because these surveys are so commonly incomplete, a goitre-bogey seems likely to be created in some parts of the world.

"In some reports of goitre-surveys confined to school-children as many as 90 per cent or more of the so-called goitres are of this 'incipient' or 'slight' kind; while not more than 2 or 3 per cent are of 'moderate size' or 'large.' When we seek for information as to the course of these slight swellings we often find that after the age of statural puberty has passed the vast majority of them have disappeared; they have represented little more than a physiological response of the gland to the needs of the organism. It is difficult to regard the data provided by such surveys as indicative of goitrigenous influences of serious import, unless they furnish other evidence whereby the endemicity of goitre can be appraised. In any community of school-children many may have thyroids the isthmus of which is visible on deglutition; while 2 or 3 per cent may be the subjects of noticeable goitres which are wholly unrelated to endemic influences.

[4] The Simple Goiters. By Robert McCarrison. Introductory remarks, p. 4. Baillière, Tindall, and Cox, London, Publishers.

Hereditary instability of the organ might itself account for this number apart altogether from other goitrigenous influences (faulty food and the like) to which children may be subjected in localities where endemic goitre is conspicuous by its absence in the general population. If the endemicity of goitre be based on such scanty criteria, then the impression might be created that few parts of the world are goitre-free; while if such surveys are viewed in the light of established knowledge regarding the course and sequelæ of the classical type of endemic goitre, one would expect to meet cretins, deaf-mutes, idiots, and goitred adults at every street-corner, and to find physical and mental deterioration to be characteristics of peoples who may in fact be amongst the most vigorous and intellectual of mankind. If, however, surveys were completed by the inclusion of adults, and if few or none of the stigmata of the classical type of endemic goitre were found, then we should know that we are dealing either with a very attenuated form of this malady, with an altogether different disease or diseases, or with no disease at all. The importance of prevalent types of goitre could then be gauged by the symptoms of thyroid disorder to which they give rise in the individual, and by the physical and intellectual damage which they cause in the community."

As the thyroid surveys in Northern Ireland and northeastern Germany included persons of all ages, it may be well to examine some of McCarrison's criticisms in the light of the findings in these countries. It is well known, of course, that the intensity of goiter symptomatology is not invariably in direct proportion to the size of the thyroid enlargement. Comparatively trivial or even unrecognized thyroid thickenings are sometimes accompanied by marked symptoms, especially when nodules are present. Therefore the criticism regarding the inclusion of slight but definite swellings does not appear to be valid.

McCarrison believes, too, that "after the age of statural puberty has passed, the vast majority of them [slight enlargements] have disappeared." Reference to figure 2, however, plainly shows a greater and maintained percentage of simple goiter up to the age of 40 years. If then the so-called slight swellings of puberty have disappeared, they have been supplanted by more lasting and presumably more serious goiters of adulthood. It was manifestly for the purpose of preventing the occurrence of simple goiter at all that prophylactic measures during puberty have been so earnestly advocated by Marine and others.

While it may be admitted that a thyroid survey confined to school children does not divulge positive evidence of goiter among adults, nevertheless such a limited study serves a valuable purpose as an indicator. Marine has pointed out that the proportional incidence

of endemic goiter among boys and girls of a given community may be used as an indication of the general incidence of the disease. Thus, when endemic goiter prevails to about the same extent in both sexes, the proportion being approximately 1 to 1, it may be expected that there is considerable goiter in all age groups. On the other hand, when the proportion of thyroid enlargements among boys and girls is as 1 to 4 or as low as 1 to 10, the general incidence of endemic goiter in the general population will be slight.

That this proportional indicator, based upon a survey of school children, is valuable can be seen by the results of the survey in Germany.

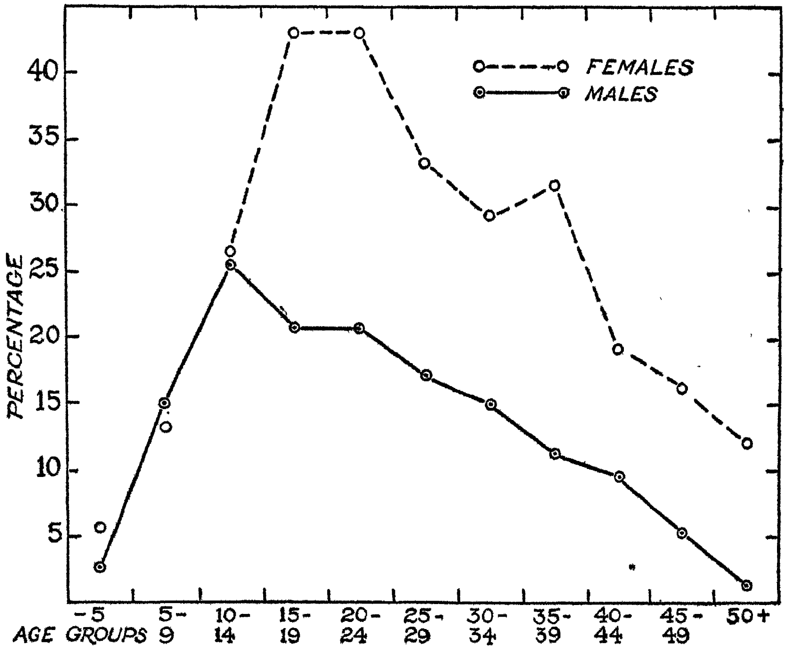


FIGURE 2.—Percentage of all degrees of thyroid enlargement among 1,976 males and 2,320 females, by age groups, examined in Berlin, Germany, during the period July 1, 1930–November 1, 1931.

The almost equal occurrence of thyroid enlargements among both boys and girls of the early age groups strongly suggests a considerable incidence of goiter, which is borne out by the survey results in other age groups. Therefore, it may be stated that while the thyroid survey confined to school children does not indicate the exact extent of goiter incidence in all age groups, it does offer a quick and reliable index, with opportunities for early prophylactic endeavor.

CONCLUSION

As shown by the results of the thyroid survey of persons of all ages, endemic goiter prevails to a considerable extent in northeastern Germany, expecially among girls and women. Nearly 3 percent of

the females examined had goiters of adenomatous character. Evidences of toxicity were noted in 14.7 percent of the women with adenomatous goiters.

In view of the considerable incidence of endemic goiter and the presence of toxic adenomata, especially among females, prophylactic endeavor appears to be indicated in this section of Germany. Some attention might likewise be directed to the prophylaxis of Graves' disease, which affection is also encountered.

TECHNIQUE FOR ROUTINE AND EXPERIMENTAL FEEDING OF CERTAIN IXODID TICKS ON GUINEA PIGS AND RABBITS

By Wm. L. Jellison, *Assistant Bacteriologist,* and C. B. Philip, *Associate Entomologist, United States Public Health Service*

In connection with the studies of disease transmission which are being made at the field station of the United States Public Health Service at Hamilton, Mont., it is frequently necessary to feed ticks on rabbits and guinea pigs under such conditions that the ticks cannot escape from the host animal and yet can be readily observed, removed, or otherwise manipulated. Until recently various modifications of the method used by Wolbach (1) have been employed. According to this technique the ticks were confined to the belly of the host animal under a hat-shaped brass gauze capsule, or cage, held in place by an adhesive tape girdle. The size of the capsule, the number of meshes per inch of the wire cloth, and other features have been varied according to needs.

Although this technique is simple and is useful for certain purposes, it does not permit close observation of feeding ticks nor their easy manipulation. Furthermore, it is unsatisfactory when removal or replacement of ticks at short intervals—sometimes repeatedly over considerable periods—is necessary. The consequent frequent partial or complete removal of the adhesive tape causes considerable skin irritation; and the ticks, if unattached and active, are difficult to control.

These faults have been overcome by substituting for the brass gauze capsules, tin capsules made from the threaded end rings and covers used in cardboard mailing tubes. These parts, separate from the tubes, may be obtained in quantity from supply houses.

The method in detail is as follows (plate I): (*a*) the portion of the end ring below the threads (A-1) is divided into teeth by a series of parallel cuts (A-2) and these teeth are then bent outward at right angles (A-3); (*b*) this ring is tightly fitted into a round hole toward one end of a wide adhesive tape band C (fig. 1) of sufficient length to form an overlapping girdle on the host animal. The threaded portion of the ring projects above the nonadhesive surface; (*c*) the nonad-

hesive surface of a short band (D) with a slightly smaller hole in its center is now applied to the adhesive surface of C so that the margins of the holes in the two bands are concentric and the under surface of the sharp metal flange is covered (fig. 2); (*d*) the host animal is prepared for infesting by clipping an area on the belly considerably larger than that to be covered by the capsule; (*e*) the completed girdle is secured to the animal with the capsule over the denuded belly area and the long end is passed around the body and overlapped; (*f*) the margins of the girdle are reinforced by narrow strips of adhesive tape (fig. 4) wrapped once or twice around the animal; (*g*) ticks are placed in the capsule and the cover is screwed on.

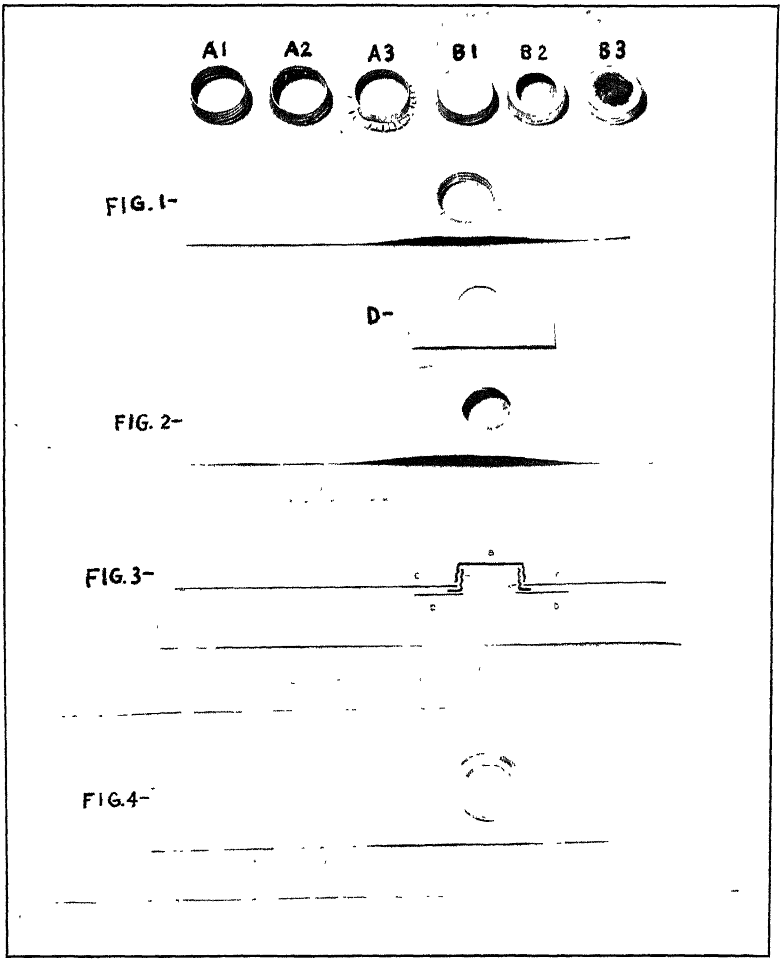
This technique can be altered to meet different conditions. The rings can be varied from small sizes useful for confining individual ticks or small numbers to the largest sizes suitable for the host animal concerned, the width of the girdle being changed to correspond. If desired, two or more rings can be inserted in the same girdle to permit the simultaneous feeding of separate lots of infected and noninfected ticks on the same host or to meet other requirements (plate II). It is usually desirable to provide for aeration by using a cover with a large hole punched in the top and covered from the inside with brass gauze. To facilitate observation, celluloid discs, with or without perforations, may be used in place of the wire gauze. They are, however, less satisfactory for ordinary use. When feeding larvae or nymphs, wisps of absorbent cotton pushed between the toothed flange of the ring and band D prevent the small ticks from becoming stuck to the adhesive surface of the upper strip of tape where it is exposed between the teeth of the flange.

Besides the ready means of access to ticks being fed experimentally, which this method affords, it has also been found to be advantageous in the engorging of immature stages of certain species that have been difficult to handle by other methods. Furthermore, by its use, adults of species showing a considerable degree of host preference, namely the brown dog tick (*Rhipicephalus sanguineus* Latreille), the winter tick (*Dermacentor albipictus* Packard), the rabbit tick (*Haemaphysalis leporis-palustus* Packard), and the bird tick (*Haemaphysalis cinnabarina* Koch), have been induced to feed on other than their normal hosts.

Under suitable conditions modifications of this technique can be employed for the feeding of ticks on larger animals—horses, cattle, sheep, dogs, and others. It has been used also in the experimental study of bloodsucking parasites other than ticks, such as lice and fleas.

REFERENCES

Wolbach, S. B.: Studies on Rocky Mountain Spotted Fever. Jour Med. Res., vol. 41, no. 1, pp. 1–197, November 1919.



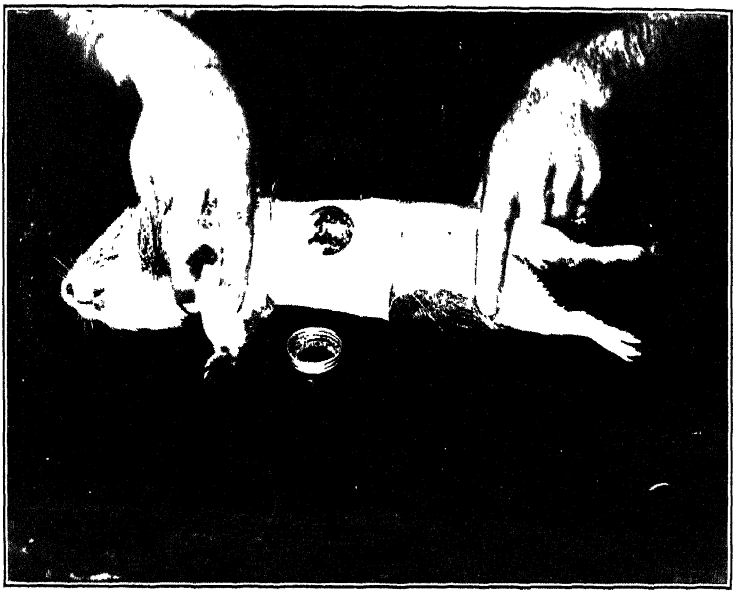
A 1, Threaded end ring from mailing tube; A 2, end ring with margin toothed; A 3, toothed margin flanged; B 1, standard mailing-tube cover; B 2, punched-out cover for insertion of celluloid or screen top; B 3, punched-out cover with screen top soldered in

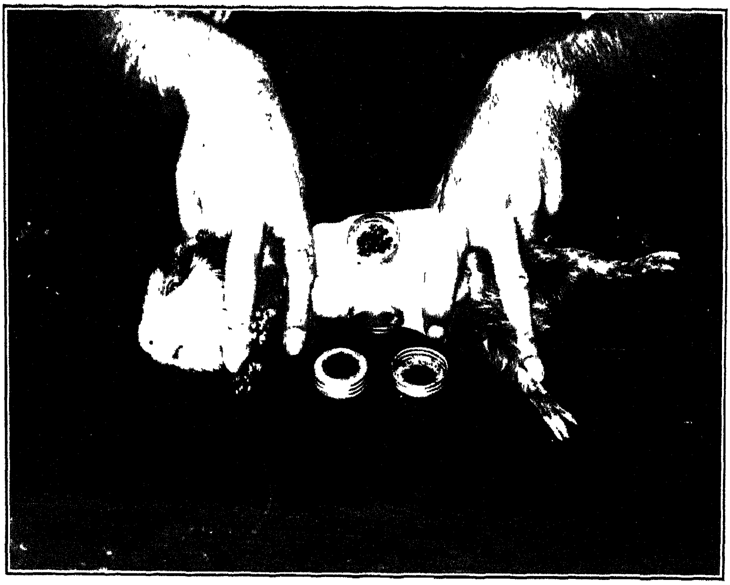
FIGURE 1.—Adhesive surface of band for girdle with flanged ring inserted. D, Short perforated band for covering sharp edge of flange.

FIGURE 2.—Band D placed over toothed flange, adhesive side up, forming continuous adhesive surface for application to the host.

FIGURE 3.—Section diagram of completed girdle (fine border line indicates adhesive surface of bands). A, Threaded and flanged ring; B, cover; C, long band for girdle; D, short band covering toothed flange.

FIGURE 4.—Nonadhesive surface of girdle with capsule in place. Narrow bands are for reinforcing margin of girdle.





Upper, Guinea pig infested with adult ticks under single capsule girdle. Screen capsule cover removed.
Lower, Guinea pig with double capsule girdle applied.

COURT DECISION RELATING TO PUBLIC HEALTH

City ordinance requiring water closets where sewer connections were possible upheld.—(Missouri Supreme Court, Div. No. 1; *City of St. Louis* v. *Hoevel Real Estate & Building Co.*, 59 S.W. (2d) 617; decided Mar. 16, 1933.) Section 2928 of the St. Louis Revised Code 1926 provided in substance that, whenever connection with a sewer was possible, all privy vaults should be filled and a water closet provided for each family, either in the house or on the lot on which the house was located. Suits were brought by the city against the defendant company to recover penalties for alleged violations of this section. The defendant owned three tenement buildings in St. Louis which were arranged for a total of 25 families. For the use of these families it maintained three privy vaults connected with the sewer. In each case it was charged that the defendant, in maintaining the said vaults, violated the above-mentioned section. In the lower courts, judgments were entered in favor of the city, and the defendant appealed to the supreme court.

One contention made by the defendant was that section 2928 conflicted with certain sections of the State and Federal Constitutions. Said section 2928 had formerly been section 1786 of the Revised Code 1914, and its constitutionality had been under consideration in the case of *St. Louis* v. *Nash* (Mo. Sup.), 260 S.W. 985, 986. In that case the enactment was held to be a valid exercise of the police power and not in conflict with the State and Federal Constitutions. It was also held that "in the exercise of police power of the State, a municipality may lawfully require a property owner to alter or reconstruct an existing building without compensation when such alteration or reconstruction is reasonably necessary to insure the public safety or to protect the public health." In the instant case the court stated that it adhered to its ruling there made.

The defendant, however, contended that the instant case was a proceeding to abate a nuisance and, for that reason, the ruling in the *Nash case* was not controlling. The only basis for the contention was the statement in the summonses that the defendant was charged in the information with violating the section by maintaining an unhealthy privy vault. The supreme court said that the defendant was tried on the information and not the summons and that the lower court correctly ruled that the information charged the defendant with violating the section by maintaining a privy vault where connection with a sewer was possible. "The condition of the vault", said the court, "was not an issue under said section. Defendant admitted ownership of the property and that it maintained thereon vaults. Connection with the sewer was possible, for defendant also admitted that the vaults were so connected. As stated, the ordinance is a valid exercise

of the police power to prevent nuisances and thereby protect the public health."

The defendant next contended that section 2928 was inconsistent with section 2922, which declared all privies and water closets without sewer connection to be nuisances unless constructed and maintained as provided in section 2923. Such latter sections were directed against privy vaults where sewer connections were not available. It was argued hat section 2928 was inconsistent with section 2922 because privies which were connected with the sewer were not included within the class declared a nuisance by section 2922. The court's answer to this was that "we must assume that section 2928 will be enforced. If so, there will be no privy vaults or water closets with available sewer connection to be classified."

Another charge of error made by the defendant was based on the trial court's refusal to permit it to show that section 2928 was enacted after the vaults were built. The supreme court answered this by saying that in the *Nash case* it had ruled that the city could lawfully require the removal of existing privy vaults and the substitution of water closets.

The judgments for the city were affirmed.

DEATHS DURING WEEK ENDED AUGUST 12, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Aug. 12, 1933	Corresponding week, 1932
Data from 85 large cities of the United States:		
Total deaths	6,599	6,582
Deaths per 1,000 population, annual basis	9.2	9.4
Deaths under 1 year of age	500	542
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	43	44
Deaths per 1,000 population, annual basis, first 32 weeks of year	11.2	11.5
Data from industrial insurance companies:		
Policies in force	67,688,177	71,360,353
Number of death claims	12,050	11,543
Death claims per 1,000 policies in force, annual rate	9.3	8.5
Death claims per 1,000 policies, first 32 weeks of year, annual rate	10.2	9.9

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended August 19, 1933, and August 20, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Aug. 19, 1933, and Aug. 20, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 19, 1933	Week ended Aug. 20, 1932	Week ended Aug. 19, 1933	Week ended Aug. 20, 1932	Week ended Aug. 19, 1933	Week ended Aug. 20, 1932	Week ended Aug. 19, 1933	Week ended Aug. 20, 1932
New England States:								
Maine		3			3	3	0	1
New Hampshire							0	0
Vermont	1				2	2	0	0
Massachusetts	11	32		1	43	55	2	1
Rhode Island	2	1				1	0	0
Connecticut	1	4	1		9	17	0	0
Middle Atlantic States:								
New York	17	33	[1] 1	[1] 4	64	120	7	3
New Jersey	11	20	2	5	28	49	1	2
Pennsylvania	20	28			47	50	2	3
East North Central States:								
Ohio	9	16	1	3	10	19	1	0
Indiana	11	22	15	12	7	5	4	8
Illinois	7	39	5	11	41	22	6	5
Michigan	12	13	2		15	101	0	2
Wisconsin	3	7	16	13	32	21	0	2
West North Central States:								
Minnesota	9	1	2	4	78	4	1	1
Iowa [2]	5	6					0	0
Missouri	15	11			7	3	1	1
North Dakota	6	3			5		1	1
South Dakota		5				4	0	0
Nebraska		7					0	1
Kansas	6	6			5	16	0	2
South Atlantic States:								
Delaware	1				1	1	0	0
Maryland [2 3 4]	7	13	2	3	8	5	1	0
District of Columbia	4			1	3		0	0
Virginia [3]	39	83			22	12	0	1
West Virginia	24	17	15		3	61	0	1
North Carolina [3 4]	18	26	2	11	19	35	0	0
South Carolina [4]	13	9	81	89	26	7	0	0
Georgia [4]	35	22		31	15	20	0	1
Florida [4]	6	8	1		14	4	1	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Aug. 19, 1933, and Aug. 20, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 19, 1933	Week ended Aug. 20, 1932	Week ended Aug. 19, 1933	Week ended Aug. 20, 1932	Week ended Aug. 19, 1933	Week ended Aug. 20, 1932	Week ended Aug. 19, 1933	Week ended Aug. 20, 1932
East South Central States:								
Kentucky	21	24					0	1
Tennessee [3]	10	9	7	20	13	2	3	3
Alabama [4]	26	29	4	8	2		0	2
Mississippi [2]	24	14					0	0
West South Central States:								
Arkansas	2	12	2		14	4	0	0
Louisiana	8	18	3	9	1	1	0	1
Oklahoma [5]	12	27	11	19	1	2	0	2
Texas [4]	51	39	28	10	21	7	3	0
Mountain States:								
Montana	1	1				33	0	0
Idaho	1		3				0	0
Wyoming [1]		1			3	2	0	0
Colorado	2	6			3		0	0
New Mexico	6	3			3		0	0
Arizona		1			6		0	0
Utah [2]	1		4		15	3	1	0
Pacific States:								
Washington	3	3			11	10	1	0
Oregon		1	6	12	19	24	0	0
California	29	27	13	70	48	24	2	1
Total	490	600	227	336	637	749	38	46

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug. 19, 1933	Week ended Aug. 20, 1932	Week ended Aug. 19, 1933	Week ended Aug. 20, 1932	Week ended Aug. 19, 1933	Week ended Aug. 20, 1932	Week ended Aug. 19, 1933	Week ended Aug. 20, 1932
New England States:								
Maine	4	3	1	1	0	0	7	9
New Hampshire	0	0	4	4	0	0	0	1
Vermont	0	0	3	5	0	0	2	0
Massachusetts	45	4	59	67	0	0	3	6
Rhode Island	3	0	3	4	0	0	0	1
Connecticut	4	2	12	17	0	0	2	3
Middle Atlantic States:								
New York	137	27	55	117	0	1	50	50
New Jersey	15	19	22	20	0	0	6	10
Pennsylvania	26	88	76	80	0	0	38	68
East North Central States:								
Ohio	12	1	51	62	0	1	41	58
Indiana	1	0	18	16	0	2	17	34
Illinois	16	5	78	51	0	2	33	53
Michigan	3	3	61	48	0	3	14	14
Wisconsin	1	2	15	8	7	0	2	1
West North Central States:								
Minnesota	17	8	8	10	0	1	3	1
Iowa [1]	2	1	7	9	0	1	5	7
Missouri	3	0	23	11	0	1	25	23
North Dakota	1	1	16	1	0	1	2	4
South Dakota	3	1	4	2	0	0	5	2
Nebraska	0	1	1	13	0	1	0	0
Kansas	2	1	38	17	0	1	15	15
South Atlantic States:								
Delaware	1	0	2	1	0	0	2	3
Maryland [2 3 4]	2	0	18	10	0	0	20	47
District of Columbia	0	0	6	2	0	0	1	1
Virginia [3]	1	3	29	26	0	0	50	40
West Virginia	6	1	20	15	2	0	41	67
North Carolina [3 4]	0	0	43	24	0	0	17	42
South Carolina [4]	0	1	4	1	1	0	32	51
Georgia [4]	0	0	11	15	0	0	21	74
Florida [4]	0	0	1	2	0	0	8	4

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Aug. 19, 1933, and Aug. 20, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug. 19, 1933	Week ended Aug. 20, 1932	Week ended Aug 19, 1933	Week ended Aug. 20, 1932	Week ended Aug. 19, 1933	Week ended Aug. 20, 1932	Week ended Aug. 19, 1933	Week ended Aug. 20, 1932
East South Central States:								
Kentucky	0	2	27	54	0	0	70	120
Tennessee [3]	8	1	17	20	0	1	75	81
Alabama [4]	0	0	14	22	1	0	36	36
Mississippi [2]	0	0	8	12	0	0	17	20
West South Central States:								
Arkansas	1	1	2	6	0	0	12	24
Louisiana	1	1	6	9	0	1	31	35
Oklahoma [5]	0	0	4	6	0	1	34	83
Texas [4]	0	2	21	17	3	2	95	28
Mountain States:								
Montana	1	0	2	4	0	3	7	2
Idaho	0	0	4	1	1	1	3	0
Wyoming [3]	0	2	5	1	0	1	3	0
Colorado	0	0	8	3	0	1	2	3
New Mexico	1	0	1	2	1	0	7	6
Arizona	0	0	4	1	0	0	17	1
Utah [2]	1	0	6	0	0	0	0	1
Pacific States:								
Washington	2	0	6	5	1	6	3	3
Oregon	2	0	6	3	5	8	8	3
California	1	6	51	42	3	5	10	12
Total	323	187	881	867	25	45	892	1,147

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Rocky Mountain spotted fever, week ended Aug. 19, 1933, 7 cases, as follows: Maryland, 1; Virginia, 1; North Carolina, 2; Tennessee, 1; and Wyoming, 2.
[4] Typhus fever, week ended Aug. 19, 1933, 61 cases, as follows: Maryland, 3; North Carolina, 2; South Carolina, 1; Georgia, 18; Florida, 2; Alabama, 14; Texas, 21.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
June 1933										
Colorado	1	11		3	34		0	70	28	2
July 1933										
California	9	139	77	8	1,122	10	16	315	35	37
Colorado	3	11			58		1	34	8	15
Illinois	17	56	59	53	445	3	23	469	18	100
Maryland		21	14	2	49	3	8	116	0	74
Minnesota	1	35	3		291		28	69	2	6
Montana		4	1		21		1	7	1	20
New Jersey	5	71	7	1	711		14	200	0	41
New York	8	177		8	1,952		109	587	0	133
Ohio	6	68	69	8	245		18	520	7	135
Rhode Island	1	10			1		1	23	0	3
West Virginia	2	42	15		61	1	10	62	0	149

	Cases
June 1933	
Colorado:	
Actinomycosis	1
Botulism	1
Chicken pox	297
Mumps	145
Puerperal septicemia	1
Rocky Mountain spotted fever	4
Vincent's angina	4
Whooping cough	89
July 1933	
Actinomycosis:	
Illinois	2
Anthrax:	
New Jersey	1
New York	1
Chicken pox:	
California	597
Colorado	94
Illinois	270
Maryland	50
Minnesota	86
Montana	45
New Jersey	334
New York	878
Ohio	352
Rhode Island	43
West Virginia	36
Dengue:	
California	1
Diarrhea:	
Maryland	44
Diarrhea and enteritis:	
Ohio (under 2 years)	37
Dysentery:	
California (amebic)	3
California (bacillary)	18
Illinois (amebic)	4
Illinois (bacillary)	10
Maryland	49
Minnesota (amebic)	1
New York	19
Ohio	3
West Virginia	2
Food poisoning:	
California	29
Ohio	15
German measles:	
California	34
Illinois	36
Maryland	2
New Jersey	14
New York	46
Ohio	30
Impetigo contagiosa:	
Colorado	5
Illinois	5
Maryland	6
Montana	4
Lead poisoning:	
Illinois	3
Ohio	11
Leprosy:	
California	2
Lethargic encephalitis:	
Illinois	4
Minnesota	1
New Jersey	3
New York	9
Ohio	1
Mumps:	
California	431
Colorado	54
Illinois	261
Maryland	88
Montana	1
New Jersey	226
Ohio	38
Rhode Island	11
Ophthalmia neonatorum:	
California	1
Illinois	9
Maryland	4
New Jersey	2
New York	3
Ohio	85
Paratyphoid fever:	
California	4
Colorado	1
Illinois	5
New York	6
Ohio	2
West Virginia	1
Psittacosis:	
Maryland	1
Puerperal septicemia:	
Illinois	5
Ohio	8
Rabies in animals:	
California	50
Illinois	14
Maryland	1
New Jersey	20
New York [1]	2
Rocky Mountain spotted fever:	
Colorado	2
Maryland	13
Montana	8
Septic sore throat:	
California	8
Colorado	1
Illinois	8
Montana	2
New York [2]	157
Ohio	104
Tetanus:	
California	8
Illinois	10
New Jersey	2
New York	16
Ohio	6
Trachoma:	
California	4
Illinois	4
Montana	2
Ohio	1
Trichinosis:	
California	2
Illinois	1
New York	2
Tularaemia:	
California	2
Colorado	2
Illinois	1
Typhus fever:	
Illinois	1
Maryland	2
New York	2
Undulant fever:	
California	16
Colorado	1
Illinois	8
Maryland	1
Minnesota	1
Montana	1
New Jersey	1
New York	19
Ohio	8
Rhode Island	2
Vincent's angina:	
Illinois	60
Maryland	10
Montana	2
New York [1]	62
Whooping cough:	
California	1,138
Colorado	66
Illinois	972
Maryland	290
Minnesota	430
Montana	91
New Jersey	687
New York	1,695
Ohio	788
Rhode Island	177
West Virginia	189

[1] Exclusive of New York City.
[2] Including delayed report of 64 cases in June.

LETHARGIC ENCEPHALITIS, ST. LOUIS, MO.

According to reports received up to September 1, 1933, there had been officially reported 424 cases of lethargic encephalitis, with 54 deaths, in the city of St. Louis and suburban area since the outbreak of the present epidemic.

PLAGUE-INFECTED GROUND SQUIRRELS, SAN BENITO COUNTY, CALIF.

The Director of Public Health of California reports under date of August 18, 1933, that plague was proved by animal inoculation in 5 squirrels received at the State bacteriological laboratory August 2,

1933, from a lot of 35 squirrels shot on a ranch, 12 miles south of Tres Pinos, San Benito County, Calif., and in 1 squirrel found dead on a ranch south of Hollister, near Paicines, received August 15, 1933.

WEEKLY REPORTS FROM CITIES

City reports for week ended Aug. 12, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	-------	0	0	0	1	0	1	0	12	16
New Hampshire:											
Concord	0	-------	0	0	1	0	0	0	0	0	11
Nashua	0	-------	0	0	0	0	0	0	0	0	0
Vermont:											
Barre	0	-------	0	0	0	0	0	0	0	0	3
Burlington	0	-------	0	0	0	0	0	0	0	0	6
Massachusetts:											
Boston	4	-------	0	19	8	10	0	16	0	70	148
Fall River	0	-------	0	0	1	1	0	2	0	1	22
Springfield	0	-------	0	1	0	0	0	2	0	6	25
Worcester	0	-------	0	10	7	2	0	1	0	10	0
Rhode Island:											
Pawtucket	0	-------	0	0	0	0	0	0	0	0	9
Providence	0	-------	0	1	2	2	0	5	1	36	52
Connecticut:											
Bridgeport	0	-------	0	3	0	1	0	0	0	0	16
Hartford	0	1	0	0	0	0	0	0	1	2	27
New Haven	0	-------	0	0	3	0	0	2	0	3	46
New York:											
Buffalo	1	-------	0	6	10	2	0	5	0	35	115
New York	17	4	2	71	90	15	0	80	44	151	1,153
Rochester	0	-------	0	0	2	0	0	0	0	8	61
Syracuse	0	-------	0	0	1	1	0	0	0	11	40
New Jersey:											
Camden	1	-------	0	2	2	0	0	0	0	0	29
Newark	0	-------	0	4	4	4	0	6	0	32	71
Trenton	0	-------	0	1	3	0	0	6	0	2	37
Pennsylvania:											
Philadelphia	5	3	3	40	11	20	0	23	2	9	410
Pittsburgh	7	1	0	0	1	13	0	3	1	53	99
Reading	3	-------	0	0	1	0	0	0	0	3	33
Ohio:											
Cincinnati	0	-------	0	13	7	4	0	10	1	31	97
Cleveland	3	2	0	1	5	13	0	12	0	67	148
Columbus	2	-------	0	1	1	6	0	4	4	1	57
Toledo	0	-------	0	1	1	12	0	6	2	12	60
Indiana:											
Fort Wayne	2	-------	0	0	0	0	0	0	0	2	30
Indianapolis	1	-------	0	0	6	0	0	4	2	17	0
South Bend	0	-------	0	0	0	0	0	0	0	1	10
Terra Haute	0	-------	0	0	0	0	0	2	0	3	17
Illinois:											
Chicago	0	2	0	13	22	49	0	40	2	90	551
Michigan:											
Detroit	9	2	0	2	0	18	0	13	2	100	164
Flint	1	-------	0	1	4	3	0	1	0	9	25
Grand Rapids	0	-------	0	0	1	0	0	1	0	14	20
Wisconsin:											
Kenosha	0	-------	0	1	0	0	0	0	0	7	5
Milwaukee	1	1	1	2	1	2	0	4	0	155	73
Racine	0	-------	0	1	1	1	0	0	0	33	13
Minnesota:											
Duluth	0	-------	0	6	1	0	1	1	0	12	14
Minneapolis	1	-------	0	1	0	1	0	2	0	4	96
St. Paul	0	-------	0	0	4	2	0	2	0	29	0
Iowa:											
Des Moines	2	-------	-------	0	-------	3	0	-------	0	0	31
Sioux City	0	-------	-------	0	-------	0	0	-------	0	1	-------
Waterloo	0	-------	-------	0	-------	0	0	-------	0	0	-------
Missouri:											
Kansas City	0	-------	0	0	4	2	0	4	0	3	73
St. Joseph	1	-------	0	0	5	0	0	0	0	0	33
St. Louis	8	-------	-------	10	2	1	0	9	7	14	163

City reports for week ended Aug. 12, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
North Dakota:											
Fargo	0	-------	0	1	0	0	0	0	0	0	8
Grand Forks	0	-------	0	0	0	0	0	0	0	3	0
Nebraska:											
Omaha	0	-------	0	0	4	0	0	1	1	15	51
Kansas:											
Topeka	0	-------	0	0	1	0	0	0	0	2	6
Wichita	0	-------	0	0	1	1	0	1	0	9	25
Delaware:											
Wilmington	1	-------	0	1	0	0	0	1	0	2	16
Maryland:											
Baltimore	1	-------	0	1	11	13	0	8	2	87	167
Frederick	0	-------	0	0	0	1	0	0	0	0	1
District of Columbia:											
Washington	4	-------	0	10	4	5	0	15	0	9	129
Virginia:											
Lynchburg	0	-------	0	8	0	0	0	0	2	17	8
Norfolk	0	-------	0	0	1	0	0	3	0	1	20
Richmond	0	-------	0	1	1	3	0	3	1	6	52
Roanoke	1	-------	0	0	0	0	0	0	3	0	18
West Virginia:											
Charleston	1	-------	0	0	0	0	0	0	1	1	13
Huntington	1	-------	0	0	0	2	0	0	0	0	0
Wheeling	0	-------	0	0	0	0	0	2	4	2	16
North Carolina:											
Wilmington	0	-------	0	0	0	2	0	1	0	0	13
Winston-Salem	1	-------	0	0	0	1	0	0	1	7	10
South Carolina:											
Charleston	0	-------	0	0	2	0	0	4	0	2	22
Greenville	0	-------	0	0	3	2	0	0	0	1	13
Georgia:											
Atlanta	8	8	0	0	10	5	0	2	[1] 14	8	70
Brunswick	0	-------	0	0	1	0	0	0	0	0	4
Savannah	3	1	0	2	1	1	0	3	0	5	26
Florida:											
Miami	0	-------	0	0	0	0	0	1	0	2	13
Tampa	0	-------	0	0	0	0	0	1	1	0	23
Kentucky:											
Ashland	1	-------	0	0	0	0	0	0	0	1	0
Louisville	2	-------	0	0	6	3	0	2	4	1	64
Tennessee:											
Memphis	0	-------	0	4	6	0	0	2	5	6	72
Nashville	1	-------	0	0	3	3	0	0	2	5	46
Alabama:											
Birmingham	3	-------	0	0	1	1	0	8	4	3	68
Mobile	0	-------	0	1	0	0	0	0	0	0	20
Montgomery	2	-------	-------	0	-------	1	0	-------	0	0	-------
Arkansas:											
Fort Smith	0	-------	-------	0	-------	0	0	-------	0	9	-------
Little Rock	0	-------	0	1	1	0	0	0	0	0	2
Louisiana:											
New Orleans	7	1	1	1	6	0	0	12	8	0	131
Shreveport	0	-------	0	0	2	2	0	2	2	0	8
Oklahoma: Tulsa	0	-------	-------	3	-------	0	0	-------	2	1	-------
Texas:											
Dallas	7	-------	0	0	0	1	0	5	3	-------	57
Fort Worth	1	-------	0	0	1	1	0	0	0	0	29
Galveston	2	-------	0	0	0	1	0	0	1	0	7
Houston	9	-------	0	3	1	0	0	3	0	0	62
San Antonio	0	-------	0	2	1	0	0	6	0	0	60
Montana:											
Billings	0	-------	0	0	0	0	0	0	0	0	5
Great Falls	0	-------	0	0	0	0	0	0	0	9	10
Helena	0	-------	0	0	0	0	0	0	0	0	3
Missoula	0	-------	0	0	0	0	0	0	0	0	1
Idaho:											
Boise	0	-------	0	0	1	0	0	0	0	0	8
Colorado:											
Denver	3	16	0	1	7	1	0	6	2	6	63
Pueblo	0	-------	0	0	1	0	0	0	0	0	10
New Mexico:											
Albuquerque	1	-------	0	0	1	1	0	1	1	1	7

[1] 9 nonresidents.

City reports for week ended Aug. 12, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Utah:											
Salt Lake City	0		0	13	1	1	0	0	1	21	25
Nevada:											
Reno	0		0	0	0	0	0	0	0	0	3
Washington:											
Seattle	0			0	1	0	0	3	0	17	69
Spokane	0	2	2	10	1	0	0		0	0	32
Tacoma	0		0	0	0	1	0	0	0	2	22
Oregon:											
Portland	0		0	2	2	7	1	2	0	0	71
Salem	0		0	0	0	0	0	0	0	0	0
California:											
Los Angeles	6	7	1	13	9	17	4	23	0	59	287
Sacramento	3		0	0	0	0	0	4	[1] 2	12	24
San Francisco	1	2	1	3	2	2	0	10	1	5	15

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts:			
Boston	0	0	18
Worcester	0	0	2
Connecticut:			
Hartford	0	0	1
New York:			
Buffalo	0	0	1
New York	6	0	81
Rochester	0	0	2
New Jersey:			
Newark	0	0	1
Pennsylvania:			
Philadelphia	1	1	1
Pittsburgh	0	0	5
Ohio:			
Cincinnati	1	0	0
Cleveland	1	0	1
Indiana:			
Indianapolis	2	0	0
Illinois:			
Chicago	6	0	1
Minnesota:			
Minneapolis	0	0	4
Iowa:			
Sioux City	1	1	0
Missouri:			
St. Louis	1	0	1
North Dakota:			
Fargo	0	0	2
Delaware:			
Wilmington	1	0	0
Maryland:			
Baltimore	0	0	1
Georgia:			
Atlanta	2	0	1
Tennessee:			
Memphis	0	1	0
Alabama:			
Birmingham	0	0	1
Washington:			
Seattle	0	0	1
Oregon:			
Portland	0	0	2
California:			
Los Angeles	1	0	0
San Francisco	1	0	0

[1] Both outside.

Lethargic encephalitis.—Cases: Springfield, Mass., 1; Bridgeport, Conn., 1; New York, 2; Newark, 1; St. Louis, 31.

Pellagra.—Cases: Philadelphia, 1; Chicago, 1; Charleston, S.C., 3; Atlanta, 1; Savannah, 2; Little Rock, Ark., 1; New Orleans, 2; Dallas, Tex., 1.

Typhus fever.—Cases: Charleston, S.C., 4; Atlanta, 3; Savannah, 1; Montgomery, Ala., 2; Houston, Tex., 1. Deaths: Savannah, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended July 29, 1933.—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the 2 weeks ended July 29, 1933, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis					3	1				4
Chicken pox			2	58	172	22	30	4	73	361
Diphtheria		1	7	28	14	19			4	73
Dysentery					1					1
Erysipelas				4				3	4	11
Influenza		6		1					49	56
Measles				279	40	6	1		2	328
Mumps					54	1	12	1	13	81
Paratyphoid fever					6					6
Pneumonia		1			6		5		9	21
Poliomyelitis				4	1	1		2		8
Scarlet fever		14		34	61	19	9	6	13	156
Trachoma							1		21	22
Tuberculosis	13	3	19	132	77	6	10	1	41	302
Typhoid fever			3	46	18	4	6	3	3	83
Undulant fever					11			1	1	13
Whooping cough		4	1	176	179	96	34	5	20	515

Quebec Province—Communicable diseases—Two weeks ended August 12, 1933.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended August 12, 1933, as follows:

Disease	Cases	Disease	Cases
Chicken pox	27	Ophthalmia neonatorum	1
Diphtheria	19	Poliomyelitis	6
Dysentery	1	Puerperal septicemia	3
Erysipelas	7	Scarlet fever	36
Influenza	1	Tuberculosis	107
Lethargic encephalitis	1	Typhoid fever	60
Measles	60	Whooping cough	155

CHILE

Santiago—Typhus fever.—On August 8, 1933, according to the latest information received, there were 264 suspected cases of typhus fever with 440 confirmed cases of the same disease in Santiago, Chile. The total number of cases of typhus fever in Santiago, since May 1933 was 1,117 with 173 deaths.

JAMAICA

Communicable diseases—Four weeks ended May 20, 1933.—During the 4 weeks ended May 20, 1933, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island of Jamaica, outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis	2		Leprosy		1
Chickenpox	6	40	Puerperal fever	2	5
Dysentery	14	21	Tuberculosis	48	105
Erysipelas		2	Typhoid fever	21	64

PUERTO RICO

Notifiable diseases—Four weeks ended August 12, 1933.—During the 4 weeks ended August 12, 1933, cases of certain notifiable diseases were reported in the municipalities of Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chicken pox	7	Mumps	21
Diphtheria	41	Ophthalmia neonatorum	4
Dysentery	234	Puerperal fever	3
Erysipelas	1	Ringworm	4
Filariasis	2	Syphilis	11
Framboesia	1	Tetanus	10
Impetigo contagiosa	1	Tetanus (infantile)	9
Influenza	33	Trachoma	1
Leprosy	1	Tuberculosis	375
Malaria	3,080	Typhoid fever	19
Measles	113	Whooping cough	158

VIRGIN ISLANDS

Notifiable diseases—May–July 1933.—During the months of May, June, and July 1933, cases of notifiable diseases were reported in the Virgin Islands, as follows:

Disease	Cases			Disease	Cases		
	May 1933	June 1933	July 1933		May 1933	June 1933	July 1933
Filariasis	1	2	1	Sprue	1		
Gonorrhea	3	3		Syphilis	21	6	12
Malaria	4	31	187	Tuberculosis	2	2	2
Measles	7	15	1	Uncinariasis			3
Pellagra	1	2	1	Whooping cough	2	2	3
Schistosomiasis			1				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Aug. 25, 1933, pp. 1056-1068. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Sept. 29, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

China—Hankow.—During the week ended July 29, 1933, 2 cases of cholera with 1 death from the same cause were reported in Hankow, China.

Philippine Islands.—During the week ended August 19, 1933, cholera was reported in parts of the Philippine Islands as follows: Cebu Province, Cebu, 1 case, 1 death; Olango Island, 3 cases, 3 deaths; Santa Fe, 2 cases, 3 deaths; Leyte Province, Ormoc, 2 cases, 2 deaths; Occidental Negros Province, San Carlos, 1 case, 1 death; Samar Province, Calbayog, 6 cases, 6 deaths; Santa Margarita, 10 cases, 5 deaths.

Plague

Egypt—Luxor.—During the week ended August 12, 1933, 1 case of plague was reported in Luxor, Qena Province, Egypt.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES
PUBLIC HEALTH SERVICE

VOLUME 48 :: :: NUMBER 36

SEPTEMBER 8 - 1933

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Comparability of Sickness Records of Public Utilities
The Effect of Calcium on Transplanted Mouse Tumors
A Study of the Intelligence of Prospective Immigrants
Deaths in Large Cities During the Week Ended August 19
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States in so far as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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COMPARABILITY OF SICKNESS RECORDS OF PUBLIC UTILITIES

By DEAN K. BRUNDAGE, *Statistician, Office of Industrial Hygiene and Sanitation, United States Public Health Service*

Analysis of the sickness records of certain public utilities has brought out some interesting facts in regard to the comparability of these records and the necessity for considering the effect upon illness rates of such factors as sex and occupation when developing work aimed at the prevention of sickness among industrial employees.

The problem of comparability of records was approached by ascertaining the frequency rates of illnesses of different duration for each one of the public utilities reporting to the United States Public Health Service in 1930 and 1931. The data for companies having similar sickness curves were included in the same graph.

THREE TYPES OF SICKNESS CURVES ACCORDING TO DURATION

This scheme disclosed three different types of curves of sickness frequency according to duration. The first one (fig. 1) starts at a high level of sickness frequency, but descends abruptly. The second curve (fig. 2) begins at a lower incidence level and descends more gradually. The third type (fig. 3) is flatter than either of the others and exhibits curious humps at the beginning of the curve. A composite curve for each of these types is shown in figure 4 to facilitate comparison.

It is obvious from the differences in the shapes and magnitudes of the sickness curves of several reporting units of the industry that direct comparison of the sickness rates of certain companies is unwarranted without consideration of the factors reflected in these dissimilar curves.

NATURE OF THE SICKNESS INSURANCE PLAN

In figure 1, which exhibits the highest sickness rates, the companies (utilities A and B) grant liberal sick leave to their employees. In each the sick-benefit plan is financed entirely by the company. In utility A the men paid on a per hour basis (group A2 in fig. 1) receive no pay for the first and second day of absence from work on

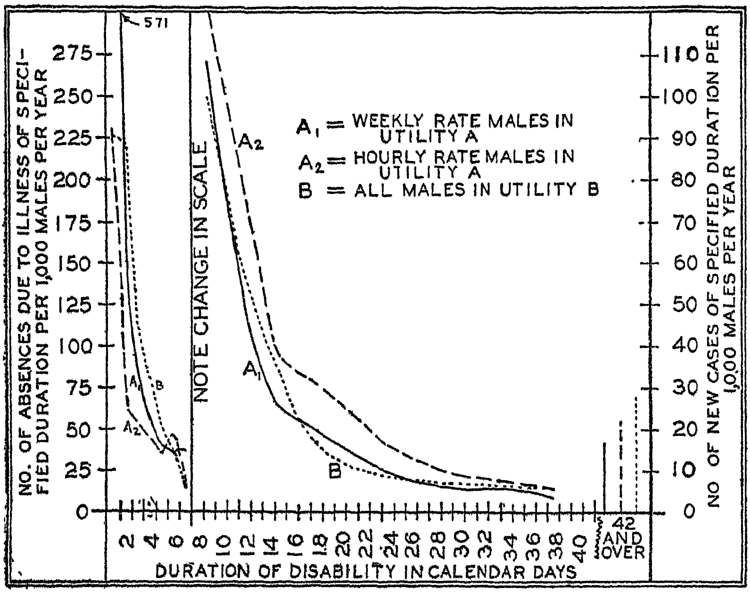

FIGURE 1.—Incidence rates of illness (including nonindustrial accidents) of specified duration in calendar days of disability. Experience in 1930 and 1931 of male employees of two public utilities paying sickness benefits which approximate full wages. (Rates for cases lasting less than 1 week are computed for each single day of duration. Rates for cases of more than 1 week are computed on a weekly basis.)

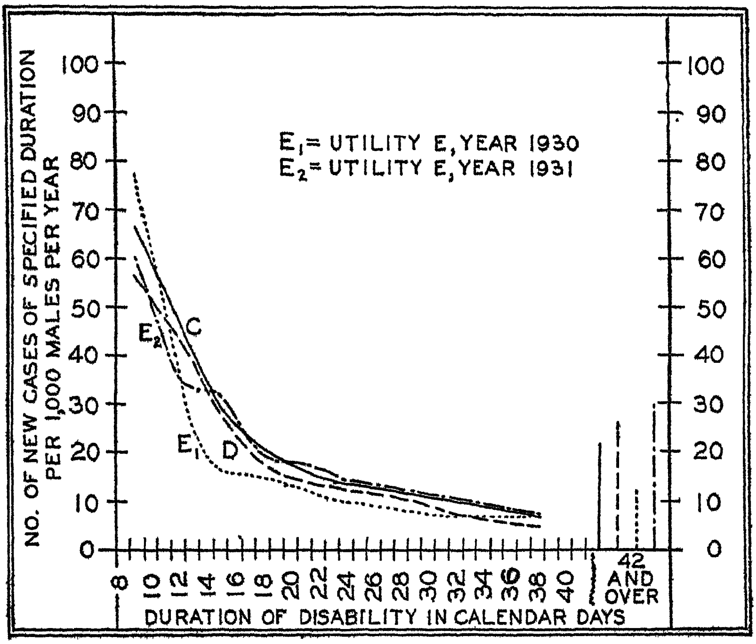

FIGURE 2.—Incidence rates of illness (including nonindustrial accidents) of specified duration in calendar days of disability. Experience in 1930 and 1931 of male employees of each of three public utilities which contribute to their employees' sick-benefit associations. (Rates are computed on weekly basis.)

account of disability, but in other respects fare the same as the men paid by the week (group A1 in fig. 1). The general provisions as regards sickness in utility A are as follows: (*a*) Persons with the company from 6 months to 2 years receive *half pay* from the first day of disability to a maximum limit of 9 weeks of either continuous or aggregate sickness within any 1 year; (*b*) persons with the company from 2 to 3 years receive *three quarters* pay from the first day of disability to a limit of 18 weeks; and (*c*) persons with the company more than 3 years receive *full* pay limited to 6 months of sickness. Persons on the monthly pay roll are not included in the statistics for utility A.

In utility B, employees of less than 1 year's service have an illness allowance at full pay of 1 day per month of employment. Individuals having more than 1 year's service receive full pay up to a limit of 15 weeks, and a certain proportion of wages thereafter, depending on the employee's length of service with the company.

These liberal provisions enable employees to stay home and undergo appropriate treatment for their ailments, especially colds and other so-called minor illnesses. Since the companies report very little evidence of malingering, it is quite possible that the record for utilities A and B approximates the normal sickness curve.

In each of the public utilities included in figure 2 the sick-benefit plan is financed jointly by the company and its employees. Among these companies utility D offers the highest schedule of benefits, but it does not so nearly approach full wages as in utilities A and B, especially as regards those on the hourly rate pay roll of utility D who receive only three fourths of the percentage of pay provided for disabled employees on the monthly rate pay roll. In this group of companies no sick benefits are paid for the first week of disability except in utility D which pays full wages to disabled workers on its monthly rate pay roll and one-half pay to disabled hourly rate employees who have had more than 2 years' service with the company.

For utility E two curves are shown—one for the year 1930 and the other for the year 1931 because the schedule of benefits was made more liberal on January 1, 1931. Benefits were increased from 50 percent to an average of approximately 66 percent of wages after the first week of disability.

In utility C the cash benefits were only \$1 per day payable after the first 5 days of any continuous sickness up to a maximum of 200 days' disability. However, medical service is provided for employees and their dependents, which obviously increases the value of the benefits.

For cases causing disability from 8 to 20 days the sickness rates shown in figure 2 tend to fall below those exhibited in figure 1. The most significant point about the sick-benefit plans of the two groups

of utilities seems to be that one group pays virtually full wages during disability for a certain number of weeks, while in the other group different proportions of total wages are paid during illness. It seems reasonable to presume that the sickness rates in the groups shown in figure 2 were more affected by economic considerations than in those in the group receiving full wages during disability. When a certain percentage of wages is sacrificed, most patients probably attempt to return to work at the earliest possible moment

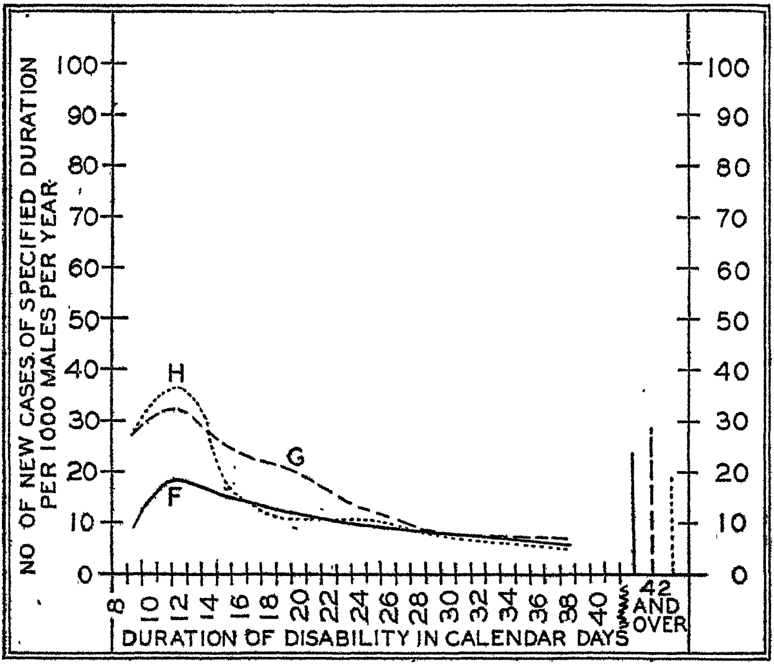

FIGURE 3.—Incidence rates of illness (including nonindustrial accidents) of specified duration in calendar days of disability. Experience in 1930 and 1931 of male employees of two public utilities which entirely finance sickness benefits for illnesses of more than 1 week's duration (companies F and G), and of one utility which contributes to its employees' sick-benefit association (company H). (Rates are computed on weekly basis.)

Whether such a tendency involves any appreciable risk of health could be ascertained only by a special study.

In the third group (fig. 3), two companies (F and G) pay the entire cost of the sick-benefit plan. Utility F pays benefits of $1 per day for each day's disablement after the seventh day, but the amount payable in any 1 year to any one employee is limited to $90. In utility G, wage earners receive half pay and salaried employees full pay up to a 6 months' maximum for any one case of illness. Differing from these company-financed plans, utility H follows a cooperative scheme of sickness insurance to which the company and those employees who belong to the mutual benefit association pay monthly

dues. The amount of cash benefits depends upon the member's length of service with the company, ranging from 65 to 75 percent of his regular wage or salary.

Despite these differences in the sickness insurance plans of the three companies, their sickness curves are much alike. In each the shape of the curve deviates from that of the normal or usual sickness curve. Ordinarily one finds that the total number of cases of sickness from all causes combined diminishes with each day's increase in duration. Thus one may expect fewer 9-day cases of sickness than 8-day illnesses, fewer 10-day than 9-day disabilities, and so on.

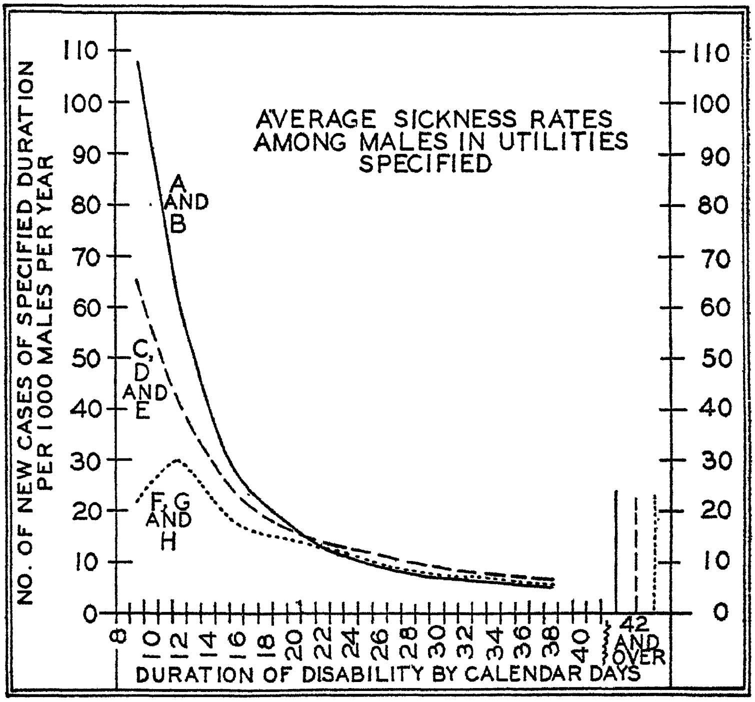

FIGURE 4.—Average incidence rates of illness (including nonindustrial accidents) for each of the groups of companies shown in the three preceding charts. (Rates are computed on weekly basis.)

This tendency is apparent in the records of absence from school on account of illness, as well as in the sickness records of industrial establishments.[1] In the three utilities under consideration there was a marked deficiency of cases lasting 8 to 12 days. That this may have been due to chance appears to be ruled out by the fairly large number of cases in each duration category (smallest number in any category, 37; largest number, 583; median, 91). Therefore, a question which may be worth investigating in these three companies is

[1] *Cf.* Health of the School Child. Pub. Health Bull. No. 200. Government Printing Office, Washington, 1931, p. 131; also Disabling Sickness among Employees of a Rubber Manufacturing Establishment in 1918, 1919, and 1920. Pub. Health Rep., Dec. 15, 1922. Reprint No. 804, p. 9.

whether all cases causing disability from 8 to 12 or more days actually get into the record either through neglect of employees to claim sick benefits for the shorter cases or for some other reason.

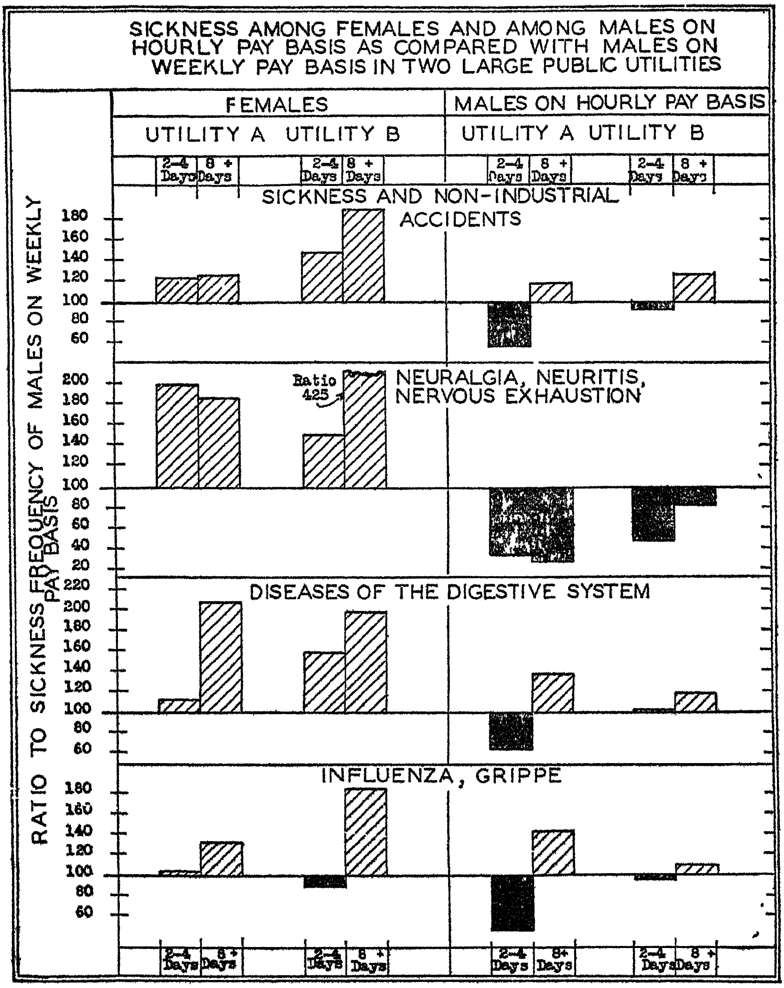

FIGURE 5.—Excess or deficiency of sickness frequency among females and among males on a per hour pay basis as compared with males on a weekly pay basis in two large public utilities during 1930 and 1931. Male sickness rates were adjusted to the age distribution of the females.

SICKNESS AMONG WOMEN AND AMONG MEN ON AN HOURLY PAY BASIS AS COMPARED WITH MEN ON A WEEKLY PAY BASIS

From the foregoing discussion it appears that utilities A and B may be placed in the same category on account of similarity of sick-leave provisions, and that their illness rates may be compared. The sickness experience of 3 groups of workers in each of these 2 com-

panies appears worth presenting in broad outline on account of certain interesting differences in their morbidity.

In utility A the incidence rate of cases causing disability for more than 1 week was higher among women and also among men on an hourly pay basis than among men on a weekly pay basis. A very small number of men are paid by the hour in utility B; but for ascertaining whether the same tendency was in evidence there for similar occupational groups, occupations were selected in utility B to correspond with those in utility A. For convenience these occupational groups are designated as "hourly rate" and as "weekly rate" males in both companies.

The "hourly rate" group includes linemen, installers, repairmen, helpers, firemen, meter testers, station operators, truck drivers, chauffeurs, oilmen, oilers, watertenders, mechanics, cleaners, porters, and laborers. They may be broadly characterized as manual workers.

The "weekly rate" males include clerks, draftsmen, salesmen, collectors, foremen, inspectors, testmen, troublemen, meter readers, and certain other occupations which for present purposes may be designated as nonmanual. Using this group as a basis for comparison, one finds that the sickness incidence rates were considerably higher among the women, and the occurrence of cases of 8 days and longer was higher also among the males doing manual work. These results cannot be attributed to differences in age, because the sickness rates of each of the two groups of males were adjusted to the age distribution of the females.

The frequency of short cases, i.e., those causing absence from work for 2, 3, or 4 days, as well as the longer cases (disabilities lasting more than 1 week) was higher among the women than among the nonmanual males, even though diseases not common to both sexes were omitted from consideration. The female rates were very high for neuralgia, neuritis, and nervous exhaustion; but the numbers on which these rates were based were not large enough for satisfactory interpretation. However, equally wide differences were found in the frequency of neurasthenia according to sex in other, more adequate data.[2] The female rates were relatively high, also, for diseases of the digestive system in each of the two companies. For influenza or grippe the female rate of cases lasting longer than 1 week considerably exceeded the corresponding rates for the group of males under consideration.

The higher rate of 8-day and longer disabilities among manual than among nonmanual male employees is partly explained by the more frequent occurrence of diseases of the digestive system and influenza

[2] *Cf.* Sickness Among Industrial Employees. Pub. Health Rep., Feb. 22, 1929. Reprint No. 1266, table 6, p. 11.

among the former. On the other hand, for the manual group the rate was surprisingly low for neuralgia, neuritis, and nervous exhaustion in each of the two utilities.

TABLE 1.—*Sickness among females and among males on an hourly pay basis as compared with males on a weekly pay basis in two large public utilities during 1930 and 1931* [1]

Disease group	Utility A				Utility B			
	2- to 4-day disabilities		8-day or longer disabilities		2- to 4-day disabilities		8-day or longer disabilities	
	Annual number of disabilities per 1,000 persons	Ratio to sickness among males on weekly pay basis	Annual number of disabilities per 1,000 persons	Ratio to sickness among males on weekly pay basis	Annual number of disabilities per 1,000 persons	Ratio to sickness among males on weekly pay basis	Annual number of disabilities per 1,000 persons	Ratio to sickness among males on weekly pay basis
Sickness and nonindustrial accidents.								
Males on weekly pay basis	282.5	100	110 8	100	448.9	100	105.1	100
Males on hourly pay basis	164 1	58	131.2	118	419.0	94	134 9	128
Females	347.5	123	139.7	126	665 3	148	199.0	189
Neuralgia, neuritis, nervous exhaustion:								
Males on weekly pay basis	3.5	100	4.3	100	7 9	100	2.8	100
Males on hourly pay basis	1.2	34	1.2	28	3.8	48	2.3	82
Females	7 0	200	8.0	186	11.9	151	11.9	425
Diseases of the digestive system: [2]								
Males on weekly pay basis	38.9	100	14.0	100	90.8	100	13.9	100
Males on hourly pay basis	24.7	64	19.2	137	93.2	103	16.5	119
Females	44.2	114	29.2	209	142.8	157	27.5	198
Influenza, grippe:								
Males on weekly pay basis	100.3	100	31.4	100	68.4	100	23.0	100
Males on hourly pay basis	46.2	46	44.4	141	65.0	95	24.9	108
Females	102.6	102	41.6	133	60.5	89	42.3	184

Number of years of life under observation, utility A: Males on weekly pay basis, 3,815; males on hourly pay basis, 4,573; females, 1,131. Utility B: Males on weekly pay basis,[3] 2,169; males on hourly pay basis,[3] 2,883; females, 1,422.

[1] Exclusive of diseases not common to both sexes. The sickness rates of the males have been adjusted to the age distribution of the females.

[2] Exclusive of diseases of the pharynx and tonsils; otherwise the same as in the International List of the Causes of Death, 4th revision, Paris, 1929.

[3] Only a few occupations in utility B are on a per hour pay basis; hence for comparative purposes the occupations in utility B which corresponded to those on an hourly pay basis in utility A were taken.

These differences appear wide enough to indicate that sickness-preventive work, if it is to be effective in public utilities, must be based on the facts obtained by analysis of sickness experience according to sex and occupation. It should be worth knowing, for example, what occupations in these utilities showed the greatest excess in illness of a digestive nature, or the highest rates of influenza, or the kinds of work that were associated with a minimum frequency of nervous exhaustion. Knowledge of the causes of the higher rate of cases lasting longer than 1 week in the manual than in the nonmanual group should prove helpful in solving whatever problems may be reflected in such differences in the incidence of illness.

SUMMARY

Wide differences in the indicated frequency of disabling sickness among employees of several public utilities were studied in relation to the plan of sickness insurance in force. The sickness rates of employees of companies granting sick leave for a certain period at full pay were found to be not comparable with the illness rates recorded for groups of employees receiving only a certain percentage of full pay during disability. When the incidence rates for illnesses of different duration were computed for each utility for which sickness records were available, three different types of illness curves resulted. The type of sickness curve and principal features of the sick-benefit plan appear as important considerations when determining the comparability of the sickness rates of one company with those of another.

In two public utilities in which the sickness data appeared to be comparable, the illness rates of male nonmanual workers were compared with those of females and of males in manual occupations. These three groups of employees showed such differences both in the frequency of total sickness and in the rates for certain groups of diseases as to indicate the desirability of periodic analysis of sickness frequency in different occupations as a basis for more effective administration of the medical and health services maintained for employees of the industry.

THE EFFECT OF CALCIUM ON TRANSPLANTED MOUSE TUMORS

By M. J. SHEAR, *Biochemist, Field Investigations of Cancer, United States Public Health Service*

In 1905 Beebe reported that the calcium content of rapidly growing human tumors was smaller than that of slowly growing tumors. Subsequent investigators have confirmed Beebe's analytical observations and, in addition, have reported that calcium therapy results in a retardation of tumor growth. It has also been reported that in cancer the total serum calcium (Theis and Benedict; Leicher; Svehla; Harnes; de Fermo) and the calcium ion concentration of the blood serum (Waterman; Rémond, Sendrail and Lassalle; Reding; Reding and Slosse; Beregoff) are diminished. Furthermore, administration of parathyroid hormone, which is an important factor in calcium metabolism, has been reported as giving favorable results in the treatment of cancer (Goldzieher and Rosenthal) and has even been advocated as a prophylactic (Reding and Slosse). Beneficial results have also been attributed (Barelli; Harde) to the use of vitamin D, which is a regulator of calcium metabolism.

During the quarter of a century that has elapsed since the initial observations of Beebe were published, a rather large literature has grown up on the subject of the role of calcium in cancer. Since this literature has already been reviewed in detail elsewhere (Shear), it will be sufficient here merely to cite the names of those who have reported obtaining a retarding effect on tumor growth in experimental animals or in patients by means of treatment with calcium: Goldzieher; Goldzieher and Rosenthal; Katase, Kawamura and Mizutani; Hoshino; Sugiura and Benedict; Händel; Goldfeder; McDonald; Paik; and Jinguu. In some instances the calcium was given orally, in others parenterally. Retarding effects of calcium on the growth of tumors *in vitro* or on the growth of tumors transplanted after immersion in solutions of calcium salts were noted by the following named investigators: Cramer; Sugiura, Noyes and Falk; Roussy and Wolf; Troisier and Wolf; Wolf; Roffo; and Roffo and Encina.

Not all of the investigators who treated malignant growths with calcium obtained favorable results. A smaller number of authors reported negative findings, following administration of calcium. However, their work was not conclusive. Thus, Rohdenburg and Krehbiel made the statement that calcium failed to cause any diminution or recession in growth of mouse sarcoma 180, but gave no details. Kimura and Wada treated pieces of transplantable tumors with calcium solutions and noted no retardation of the rate of growth of the tumors as a result of the treatment; the number of animals used was not stated. Renaud injected cancer patients with calcium gluconate, but all the cases went to a fatal termination; the calcium salt did not cause recession or prevent metastases. No mention was made of the number of patients so treated. Koerbler treated rats bearing a transplanted sarcoma with a calcium preparation without effect; details, however, were not given. Slosse and Reding obtained poor results on injecting $CaCl_2$ intravenously into 10 cancer patients; but later Reding and Slosse maintained that efforts should be made to raise the serum calcium ion concentration in cancer by means of parathormone.

The few reports of negative results following treatment with calcium were not sufficiently convincing to warrant the conclusion that calcium is without effect on tumor growth. On the other hand, the reports of positive results, while more numerous, were not sufficiently conclusive either. It was therefore considered desirable to investigate the effect of calcium treatment on transplanted mouse tumors. Since the results obtained were essentially negative, the various experiments will be described but briefly.

PARENTERAL ADMINISTRATION

(In collaboration with Biologist H. B. Andervont)

In these experiments the solutions used were 5 percent calcium lactate, 5 percent calcium gluconate, and 10 percent sodium lactate.

EXPERIMENT I

Calcium lactate.—Two weeks prior to inoculation with sarcoma 180, a 5 percent solution of calcium lactate was injected intravenously into 12 mice in 0.15 cc doses. The solution was injected intravenously eight times, after which the injections could no longer be made in the same way because of the condition of the tail and it was then given twice by the subcutaneous route.

After inoculation, the mice were given 9 intraperitoneal injections of 0.3 cc each. Tumors appeared in only 3 mice, and in 2 of these the tumors receded. In the controls, tumors appeared in 18 out of 20 mice.

However, the mice were in poor condition as a result of the treatment with calcium lactate.

Calcium gluconate.—Another group of 12 mice was given 0.2 cc doses of a 5 percent calcium gluconate solution in an analogous fashion, beginning 2 weeks prior to tumor inoculation; 8 injections were given by the intravenous route and 2 by the subcutaneous. Only 7 mice survived the 2 weeks' treatment, after which the survivors were inoculated with sarcoma 180. The mice were then given several subcutaneous injections of 0.3 cc and several more of 0.5 cc, totaling 9 additional injections.

For about 2 weeks the tumors in the treated mice were smaller than the control tumors; the percentage of takes was also less in the former than in the latter. But 2 weeks later the results, both as to the percentage of takes and as to the size of the tumors, were the same in both groups.

Sodium lactate.—The effect of sodium lactate was also studied. Ten mice were given 13 intravenous doses of 0.3 cc each, and 10 were given 13 subcutaneous doses of 0.5 cc each, of a 10 percent sodium lactate solution. Then the mice were inoculated with sarcoma 180. The administration of sodium lactate was continued following inoculation, in 0.5 cc subcutaneous doses.

No effect on tumor growth or on the percentage of takes was noted.

EXPERIMENT II

Calcium lactate.—This solution was given intraperitoneally to 10 mice in 9 doses of 0.3 cc each, beginning the day before inoculation with sarcoma 180. All the mice survived, but no effect on the tumors was noted when compared with the controls.

Calcium gluconate.—This solution was given subcutaneously to 10 mice in 8 doses of 0.5 cc each, beginning the day before inoculation with sarcoma 180. Nine mice survived, but no effect on the tumors was noted when compared with the controls.

EXPERIMENT III

Eleven mice were given calcium lactate and 11 were given calcium gluconate intraperitoneally. The mice did not tolerate 0.5 cc doses, and some of them died; the dose was reduced to 0.2 and 0.3 cc levels. Treatment was begun 2 weeks prior to inoculation with sarcoma 180 and was continued until 16 injections had been given.

The tumors in the treated mice were no different from those in the 22 control mice.

EXPERIMENT IV

Twelve mice were given calcium gluconate intraperitoneally and 12 subcutaneously; 22 other mice were given calcium lactate intraperitoneally. Treatment was begun 10 days before inoculation with sarcoma 180 and was continued subsequently to a total of 17 injections of 0.2 or 0.3 cc each.

This treatment produced no detectable effect on the tumors when comparison was made with the controls.

EXPERIMENT V

Twenty-four mice were given 7 intravenous injections of 0.15 cc each, 12 receiving calcium gluconate and 12 calcium lactate. They were then inoculated with sarcoma 180, and were given 6 intraperitoneal injections of 0.3 cc each, of the respective solutions.

The tumors took in all cases. When the experiment was terminated, the tumors were as large, in most cases, as in the controls; however the tumors receded in 3 given calcium gluconate and in 1 given the calcium lactate.

DIET EXPERIMENTS

I. 3.3 Percent Calcium Chloride

$CaCl_2$ was mixed in the ration so as to give a calcium content of 1.2 percent. This was fed to 20 mice for 3 weeks, at the end of which time these mice together with 20 controls, were inoculated with carcinoma 63. The high calcium diet was continued after inoculation. Three weeks after inoculation there were more tumors among the control mice than among the treated mice, but one week later the percentage of successful takes was the same in both groups.

In this experiment, therefore, the calcium chloride seemed to delay the appearance of the tumors somewhat, but the number of takes and the size of the tumors were approximately the same in both groups five weeks after inoculation.

II. 2.75 Percent Calcium Chloride

Twenty mice were fed a diet consisting of 3 parts whole wheat flour and 1 part whole milk powder; this ration also contained 1 percent calcium in the form of $CaCl_2$. The test diet was given for 2 months, at the end of which time these mice, together with 20 control mice, were inoculated with sarcoma 180. In both groups there were 100 percent takes. The tumors in the treated mice were somewhat smaller, on the average, than those in the controls, but no marked difference was noted.

III. Modified Steenbock Diet

A diet was prepared similar to ration 2965 of Steenbock and Black, except that the 1.2 percent calcium was provided by $CaCl_2$ instead of $CaCO_3$. Another similar diet was prepared containing 2.0 percent $CaCl_2$ instead of 3.3 percent.

These diets are rich in calcium and poor in phosphorus, and consequently promote the absorption of large amounts of calcium. The chloride, which is an acid-forming salt in the body, was used instead of the carbonate, since it is alleged that in cancer there is a tendency to alkalosis.

These 2 diets were given to 2 groups of 30 mice each for 9 days prior to inoculation with sarcoma 180; the same dietary regime was continued until the experiment was terminated. The control group also consisted of 30 mice.

No pronounced difference was noted in the tumors. Although among the treated mice there were more small tumors than in the controls, the results were not striking.

IV. $CaCl_2+NH_4Cl$

A. In order to increase the acid-forming properties of the diet, NH_4Cl was added in addition to $CaCl_2$. The basal ration (3 parts whole wheat flour to 1 part whole milk powder) was fed to 20 control mice, while the test ration, consisting of the basal ration plus 3.3 percent $CaCl_2$ and 1.5 percent NH_4Cl, was fed to another group of 20 mice beginning with the day of inoculation with sarcoma 180. After 15 days the NH_4Cl content was increased to 2.0 percent.

After 4 weeks the tumors in the treated mice were just as large, in some cases, as those in the controls; in many others, however, the tumors were definitely smaller.

B. Carcinoma 63 was inoculated into 40 young mice. A week later half of the mice were given the diet containing 3.3 percent $CaCl_2$ and 2.0 percent NH_4Cl.

The mice appeared in good condition, but did not grow. However, no retarding effect on tumor growth was noted.

C. Since, in some experiments, there were indications of a retarding effect, the experiment was repeated, using 200 mice. The mice were divided into 5 groups of 40 mice each, as follows:

Group A: Basal diet+3.3% $CaCl_2$+1.5% NH_4Cl.
Group B: Basal diet+3.3% $CaCl_2$+2.0% NH_4Cl.
Group C: Basal diet+3.3% $CaCl_2$+2.5% NH_4Cl.
Group D: Basal diet+3.3% $CaCl_2$+3.0% NH_4Cl.
Group E: Basal diet alone (controls).

After administration of these diets for 1 week, all the mice were inoculated with sarcoma 180. The diets were continued until the end of the experiment. The mice tolerated these high-salt diets fairly well.

No clear-cut differences were noted between the tumors in the treated and control mice 3 weeks after inoculation. However, the tumors in the mice of groups A and B did not grow quite as well as those in the other groups.

V. Protein+$CaCl_2$

Because of interesting results which were being obtained with proteins in some other experiments, mice were given a high protein diet in addition to $CaCl_2$.

A. Sarcoma 180 was inoculated into 16 mice. After 11 days a high protein diet consisting of 1 part dried egg albumin and 2 parts whole-milk powder was given to 6 of these mice; 10 days later 3.3 percent $CaCl_2$ was included in the experimental ration.

No beneficial results were noted.

B. Sarcoma 180 was inoculated into 30 mice. Three days later the high protein diet was given to half of the mice; 10 days later 3.3 percent $CaCl_2$ was also included in the diet.

In 3 of the treated mice, the tumors were "eaten out", and in 1 other the tumor had receded.

C. Carcinoma 63 was inoculated into 30 mice. Two weeks later half of the mice were given the high-protein diet, and 1 week later 2 percent $CaCl_2$ was also given.

The tumors in the treated mice were somewhat smaller than the control tumors, but the difference was not striking.

D. The high-protein diet plus 1 percent $CaCl_2$ was given to 16 young mice on the day of inoculation with carcinoma 63. The $CaCl_2$ content was increased to 2 percent 4 days later. The growth of the mice was stopped; they remained small and thin, and many of them died. No effect on tumor growth was obtained.

VI. Protein+$CaCl_2$+NH_4Cl

A. Whole-milk powder containing 3 percent of a salt mixture consisting of 2 parts $CaCl_2$ to 1 part NH_4Cl was given to 13 mice. Four

days later they were inoculated, together with 14 controls, with sarcoma 180.

The tumors in the treated mice were smaller than those in the controls, but the treated mice did not do well; most of them died within 1 month after inoculation, at which time most of the controls were still alive.

B. Thirty mice were inoculated with carcinoma 63. Two weeks later half of the mice were given the high protein diet. One week later 3.3 percent $CaCl_2$ and 2.0 percent NH_4Cl were included in the experimental ration.

Administration of this diet for 4 weeks failed to produce any noticeable effect on tumor growth.

C. Fifteen mice were given a diet consisting of equal parts of egg albumin and milk powder; another 15 mice served as controls. The test mice did not do well on this high protein diet; it was therefore changed to 1 part egg albumin to 2 parts milk powder. After 3 weeks on the high protein diet, 3.3 percent $CaCl_2$ and 2.0 percent NH_4Cl were included in the ration. Two weeks later all the surviving mice were inoculated with sarcoma 180.

There was no difference between the tumors of the treated and the control mice 3 weeks after inoculation.

ORAL ADMINISTRATION OF CALCIUM SOLUTIONS

In the following study the experimental groups received salt solutions to drink in lieu of the distilled water which the control groups received. Unless otherwise stated, these solutions were administered until the experiments were terminated.

I. Calcium Lactate

Sarcoma 180 was inoculated into 20 mice. Five days after inoculation a 0.5 percent solution of calcium lactate was given to half of the mice; the concentration was gradually increased until they were getting a 5 percent solution. The other 10 mice served as controls.

When the experiment was ended, 1 month after tumor inoculation, no effect on the treated tumors was noticeable.

II. Calcium Lactate+Urea

A 0.5 percent solution of calcium lactate was given to 50 mice beginning 9 days prior to inoculation with sarcoma 180. The dose was gradually increased until the groups (of 10 mice each) were receiving 1, 2, 3, 4, and 5 percent solutions of calcium lactate, respectively.

In some other experiments on proteins and cellular permeability, attention was given to urea because of its solvent action on proteins. On the chance that urea might increase the amount of calcium entering the tumor cells, urea was added to the beverages of 2 groups of the

mice 1 week after tumor inoculation. These groups received 1 percent calcium lactate plus 4 percent urea, and 2 percent calcium lactate plus 3 percent urea, respectively.

Some of the mice developed diarrhea, but most of them tolerated the solutions and survived as long as the 20 control mice. No effect on tumor growth was noted in any of the 5 groups.

III. Ca Lactate + Urea or $CaCl_2$ + Urea

A. A 1 percent solution of urea was given to 35 mice 3 weeks prior to inoculation with sarcoma 180. The concentration of urea was gradually increased to 5 percent.

On the day of inoculation, 1 percent calcium lactate was dissolved, in addition to the urea, in the solution that 15 mice received; the remaining 20 mice received a solution containing 0.2 percent $CaCl_2$ in addition to the urea. These solutions were administered until the experiment was terminated, the concentration of $CaCl_2$ being increased in the course of the experiment to 0.75 percent.

No effect on tumor growth was noted when compared with the 20 control mice.

B. The preceding experiment was repeated on a larger scale, using 150 mice.

One month prior to inoculation with sarcoma 180, a 1 percent solution of urea was given to 130 mice. The concentration was gradually increased until they were all receiving a 5 percent urea solution to drink. One week before inoculation the solution of 1 group was changed to include, in addition, 1 percent calcium lactate, and in the case of 4 other groups it was changed so as to include 0.2 percent $CaCl_2$ in addition to the urea. The concentration of the $CaCl_2$ was gradually increased until the various groups were getting solutions of the following composition:

Group	Calcium salt	Urea	Group	Calcium salt	Urea
	Percent	Percent		Percent	Percent
A (control)	0	0	E	1.0 $CaCl_2$	5
B	0	5	F	1.5 $CaCl_2$	5
C	1 calcium lactate	5	G	2.0 $CaCl_2$	5
D	0.75 $CaCl_2$	5			

Most of the mice died within 3 weeks after inoculation with sarcoma 180 with the exception of the controls and the group that received 0.75 percent $CaCl_2$ plus 5 percent urea.

The tumor took successfully in all cases. In the treated mice that survived 3 weeks after tumor inoculation, the tumors were somewhat smaller than those in the control mice.

IV. Urea

A 1 percent urea solution was given to 20 mice; the concentration was gradually increased to a 7 percent solution before the mice showed serious effects. They were then given water for a few days and then a dilute urea solution, which was gradually made stronger until they were getting a 6 percent solution. It was amazing to see the avidity with which they drank these strong urea solutions; in a number of instances the mice fought for a turn at the nipple.

Sarcoma 180 was implanted into these mice 2 weeks after institution of the urea regime; 10 controls were inoculated at the same time.

No effect was noted on tumor growth.

V. $CaCl_2$+Glucose

A. In view of the reported hyperglycemia of cancer (Woodward and Fry), it was considered of interest to determine the effect of glucose administration on tumor growth.

Two weeks prior to inoculation with sarcoma 180 a 1 percent solution of glucose was given to 42 mice. When inoculated, the mice were divided into 2 groups; in one group the glucose concentration was increased to 3 percent; in the other it was increased to 2 percent, and 1 percent $CaCl_2$ was added as well.

The mice that received 3 percent glucose did well and the tumors were as large as in the 20 control mice. Those that received glucose and $CaCl_2$ did not do well; most of them died within 3 weeks after tumor inoculation.

B. Fifty mice were given a 1 percent glucose solution 3 weeks prior to inoculation with sarcoma 180. The mice were divided into a number of groups and the glucose concentration was increased to a maximum of 5 percent. On the day of inoculation, urea or $CaCl_2$ was added to some of the solutions. The various groups were finally receiving the following solutions:

Group	Glucose	Urea	$CaCl_2$	Group	Glucose	Urea	$CaCl_2$
	Percent	*Percent*	*Percent*		*Percent*	*Percent*	*Percent*
A (Control)				D	5	0	0
B	3	2	0	E	4	1	0
C	3	0	2	F	4	0	1

The mice of group C, which received 2 percent $CaCl_2$ in addition to glucose, died within 3 weeks of tumor inoculation; those in group B died off almost as fast. The other groups did about as well as the controls. It was of interest to note that the mice which received glucose were in excellent condition; their coats were noticeably fine.

No effect on tumor growth was observed.

VI Calcium Citrate+Calcium Lactate

A 1 percent salt solution consisting of equal parts of calcium citrate and calcium lactate was given to 25 mice, beginning with the day of inoculation with sarcoma 180. One week later the concentration was increased to 2 percent; administration was continued until the experiment was terminated.

No effect on the tumors was noted when comparison was made with an equal number of controls.

DISCUSSION

Most of the results obtained on treating tumor-bearing mice with calcium were negative. The few instances in which there was retardation of tumor growth, or recession of the tumors, may have occurred as a result of the poor condition of the mice and not because of any specific action of calcium on the tumor. When the treatment is so drastic that the mice lose weight and vigor, caution must be exercised in assigning the cause of the mildly inhibiting effects that were sometimes noted.

The slight retardation of tumor growth which was occasionally noted in the treated mice was not regularly reproducible. If calcium does have a retarding effect on tumor growth, the effect is apparently only a minor one and is operative only when other factors are favorable.

This latter hypothesis was tested by administering other substances together with the calcium salt. In view of the statements made as to the value of offsetting alkalinity in cancer, NH_4Cl was given because of its acid-forming properties. Urea was given because of its solvent effect on proteins, and because it might thereby affect cellular permeability. Glucose and lactate were given on the chance that they might disturb the carbohydrate metabolism of the tumor cells and thus interfere with their proliferation. A high protein diet was given because other experiments indicated that proteins might affect fluid exchange between the malignant cells and the tissue fluids. Citrate, because of its role in the prevention of fibrin formation from fibrinogen, was given following some observations on fibrin formation made in the course of another investigation.

These substances were given alone and together with calcium. In no case was a clear-cut, regularly obtainable, inhibiting or retarding effect noted. Since promising results were not obtained with transplanted tumors, the experiments were not extended to spontaneous tumors.

This lack of pronounced effect cannot be due to failure of the calcium to penetrate into the tumor cell. Kluge has shown that when $CaCl_2$ or calcium gluconate is injected subcutaneously, there occurs a rapid increase in the calcium content of tumors. The calcium content

rises to a maximum in about 2 hours and then decreases almost as rapidly, reaching the original value about 4 hours later. This work shows that calcium enters and leaves the tumor with ease.

Although a considerable number of authors have asserted that calcium has a retarding effect, the individual contributions are far from convincing. A common weakness is the employment of an insufficient number of experimental animals. Another weakness is the utilization of single experiments as the basis for conclusions regarding the positive value of substances used therapeutically. Unfortunately, repetition of experiments in an apparently identical fashion does not always give the same results in the case of transplanted tumors. A given strain of tumor may vary in its characteristics, growing well at times and poorly at others. Not infrequently a portion of the tumor may be infected; if it so happens that the test mice are inoculated with pieces of infected tumor whereas the control mice receive uninfected pieces, the poor growth of the tumors in the test group may be unjustifiably ascribed to the therapeutic treatment. It is of importance, therefore, not only to use a sufficiently large number of test animals and control animals, but also to repeat the experiments which give positive results. Only when the positive results are obtainable with regularity is it permissible to ascribe the beneficial results to the treatment.

In this investigation no untoward results were noted following the use of moderate amounts of calcium. Calcium salts may, in fact, be found to have a use in the treatment of cancer patients (Behan), since it appears that calcium is capable of alleviating pain in a number of clinical conditions. No contra-indication to the use of calcium was noted in this study.

SUMMARY

1. The effect of treatment with calcium salts on mouse sarcoma 180 and mouse carcinoma 63 was studied using more than 1,200 tumor-bearing mice.

2. Calcium chloride, calcium lactate, calcium citrate, and calcium gluconate were employed. The salts were administered either in the drinking water or mixed with the food, or were injected parenterally.

3. A definite, regular, retarding effect on tumor growth was not obtained.

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THE INTELLIGENCE OF THE PROSPECTIVE IMMIGRANT

The Public Health Service has recently published a report[1] on a study of the intelligence of about 500 applicants for American visas in Warsaw, Poland, as measured by their ability to do language and nonlanguage tests. In giving the tests, trained interpreters were used and the methods were standardized throughout. The group studied was a fair sample of applicants for visas but not of the general population of Poland. The persons studied were between 15 and 45 years of age, of both sexes, and selected from both Slavish and Jewish applicants for visas.

The most valuable of the language and nonlanguage tests have been grouped into scales with appropriate percentile tables for the quantitative interpretation of the results.

A method for setting up a standard of literacy is suggested.

Analysis of the data indicates that—

1. On performance tests the results obtained compare fairly well with those published for American school children over 10 years of age.
2. On language tests the results fall definitely, and for certain tests, strikingly, below those for American school children over age 10.
3. Differences in ability on both language and nonlanguage tests are found to be associated with sex, schooling, and age. Differences associated with race are slight. On nonlanguage tests, the greatest differences are associated with sex; on language tests, with schooling. The most consistent variation is that associated with age, the older groupings tending very uniformly to give poorer results on both types of tests.
4. Differences associated with sex are more marked than those found among American school children and are more marked on nonlanguage than on language tests.
5. Weighting of "raw" scores apparently adds little to the discriminative value of a given test.
6. When an opportunity is given to learn by experience, apparent differences in ability between groups tend to decrease.

The standards will be of assistance in the determination of mental ability in persons from Eastern Europe without much education. In addition to their value in immigration work, they should be useful in institutions dealing with foreign-born persons suspected of being mentally defective.

COURT DECISION RELATING TO PUBLIC HEALTH

Provision of city ordinance regarding use of marked bottles or other containers for milk held invalid.—(Florida Supreme Court, Div. B; *Logan, Chief of Police,* v. *Alfieri,* 148 So. 872; decided June 9, 1933.)

An ordinance relating to milk contained the following.

[1] Public Health Bulletin No. 206

(c) Milk, cream, or buttermilk may be delivered, distributed, sold, offered for sale, or held for sale in either plain or marked bottles, carton[s], or other containers. When marked bottles, cartons, or other containers are used, it shall be unlawful for said bottle, carton, or other container to bear any name, trade name, or trade mark other than that of the producer or distributor whose name appears upon the cap, seal, or cover of said bottle, carton, or container.

The defendant in error sued out a writ of habeas corpus alleging that he was unlawfully restrained of his liberty upon a charge of violating the above-quoted paragraph. It was contended in the lower court that the said paragraph was unconstitutional and void because in conflict with section 1 of the declaration of rights of the State constitution. The court held the paragraph in question to be unconstitutional and invalid, and the case was taken to the supreme court.

The latter court said that the provision of the ordinance under consideration, in effect, required that the name of the producer or distributor should appear upon the cap, seal, or cover of the bottle, carton, or container, and that in that provision the ordinance must certainly be held to be within the police power. But it was pointed out that the provision went further, the court saying that "The trade name of the manufacturer of the milk bottle blown into the side or bottom of the bottle cannot, by any reasonable conclusion, mislead the consumer as to the contents of the bottle nor as to the identity of the producer or distributor of the milk." The view was taken that the provision in question was invalid, the supreme court concluding its opinion with the following:

If the language used in the ordinance could be construed to mean only that the use, by one producer or distributor, of bottles bearing the name or trade-mark of another producer or distributor is prohibited, it could be held valid, but, if construed otherwise, it would effect an unwarranted interference with property rights.

There is nothing before us to show in what manner the ordinance was alleged to have been violated. The ordinance, on its face and according to its plain language, is unreasonable and arbitrary and easily lends itself to unlawful interference with individual rights and to the oppression of the weak.

The judgment of the court below was affirmed.

DEATHS DURING WEEK ENDED AUGUST 19, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Aug 19, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	6,454	6,544
Deaths per 1,000 population, annual basis	9.0	9.3
Deaths under 1 year of age	442	606
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	37	50
Deaths per 1,000 population, annual basis, first 33 weeks of year	11.1	11.5
Data from industrial insurance companies:		
Policies in force	67,700,569	71,207,172
Number of death claims	11,220	11,355
Death claims per 1,000 policies in force, annual rate	8.6	8.3
Death claims per 1,000 policies, first 33 weeks of year, annual rate	10.1	9.9

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended August 26, 1933, and August 27, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended August 26, 1933, and August 27, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932
New England States:								
Maine		1	1				0	0
New Hampshire							0	0
Vermont					4	2	0	0
Massachusetts	15	14		1	28	27	1	2
Rhode Island		2			5	1	0	0
Connecticut	4	5		1	1	14	0	0
Middle Atlantic States:								
New York	23	42	[1] 3	[1] 3	45	106	10	5
New Jersey	10	11	1	1	15	59	0	0
Pennsylvania	27	30			57	40	3	7
East North Central States:								
Ohio	10	24		1	10	8	0	1
Indiana	13	35	55	17	5	5	0	4
Illinois	19	37	20	2	8	33	3	0
Michigan	24	3		8	8	39	0	2
Wisconsin	5	7	19	20	12	27	0	3
West North Central States:								
Minnesota	6	4		1	11	5	1	0
Iowa [2]	4	4				1	0	0
Missouri	9	9	7	2	1	5	1	1
North Dakota	5	2			11	7	1	1
South Dakota		3			1		0	1
Nebraska	3	8			3	3	1	0
Kansas	6	9		3	10	89	0	0
South Atlantic States:								
Delaware							0	0
Maryland [2, 3]	7	16	5	13	2	3	0	0
District of Columbia	8	5	1		3	2	0	0
Virginia	27	19			15	25	1	0
West Virginia	26	15	25	11	15	23	1	0
North Carolina [3, 4]	41	35	4	2	13	23	1	1
South Carolina [4]	25	10	83	99	34	22	0	1
Georgia [4]	49	15		18	32	7	0	0
Florida [4]	11	14	2	1	32	2	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended August 26, 1933, and August 27, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932
East South Central States:								
Kentucky	30	43	15				0	2
Tennessee	14	38	19	8	20	2	1	1
Alabama [4]	47	39	11	7	11	1	0	1
Mississippi [2]	25	27					0	0
West South Central States:								
Arkansas	12	10	4	7	5		0	0
Louisiana	20	17	5	6	6	2	2	1
Oklahoma [5]	26	26	9	13	11		0	0
Texas [4]	57	43	52	5	28	8	1	0
Mountain States:								
Montana			2		1	106	0	1
Idaho							0	0
Wyoming			1		1		0	0
Colorado	4	8				4	0	0
New Mexico	2	6			2		0	0
Arizona	2	2		2	11	1	0	0
Utah [2]	1				9	1	0	1
Pacific States:								
Washington	1	2			8	4	4	0
Oregon	2	6	5	7	11	15	0	0
California	23	33	17	160	70	28	3	2
Total	643	684	366	419	575	750	35	38

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932
New England States:								
Maine	2	0	6	8	0	0	3	4
New Hampshire	1	0	1	1	0	0	0	0
Vermont	0	0	4	8	0	0	1	0
Massachusetts	35	1	70	78	0	0	7	8
Rhode Island	2	2	8	9	0	0	1	1
Connecticut	0	1	14	7	0	0	3	0
Middle Atlantic States:								
New York	133	22	73	100	0	3	40	54
New Jersey	17	33	19	38	0	0	5	12
Pennsylvania	29	136	108	77	0	0	41	68
East North Central States:								
Ohio	20	0	85	62	0	1	48	70
Indiana	2	0	31	33	0	1	23	20
Illinois	17	6	103	60	0	0	32	42
Michigan	8	5	62	51	0	0	40	14
Wisconsin	2	1	11	12	4	0	3	0
West North Central States:								
Minnesota	18	7	10	14	1	0	0	6
Iowa [2]	0	1	13	8	0	4	2	7
Missouri	2	0	8	10	0	0	20	48
North Dakota	5	4	7	9	0	0	0	2
South Dakota	0	2	2	1	0	0	2	5
Nebraska	2	1	16	12	0	1	0	7
Kansas	2	2	35	17	0	0	8	15
South Atlantic States:								
Delaware	8	0	8	4	0	0	7	3
Maryland [2 3]	0	2	14	23	0	0	13	31
District of Columbia	0	1	4	6	0	0	3	2
Virginia	0	2	30	32	0	0	26	47
West Virginia	5	4	24	14	0	0	48	73
North Carolina [3 4]	1	1	37	32	0	0	26	22
South Carolina [4]	1	4	3	6	1	0	32	36
Georgia [4]	0	0	15	19	0	0	40	64
Florida [4]	0	0	2	2	0	0	4	4

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended August 26, 1933, and August 27, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug 26, 1933	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932
East South Central States:								
Kentucky	0	0	39	33	0	0	100	98
Tennessee	6	3	65	18	0	1	67	94
Alabama [4]	0	1	24	28	0	0	25	43
Mississippi [2]	0	1	5	7	0	4	9	26
West South Central States:								
Arkansas	0	1	4	8	0	1	28	20
Louisiana	2	1	12	6	0	0	26	36
Oklahoma [5]	4	0	5	12	0	1	46	55
Texas [4]	1	0	31	16	2	3	54	33
Mountain States:								
Montana	1	0	0	4	1	2	3	7
Idaho	0	0	4	1	0	0	0	7
Wyoming	0	0	2	4	0	8	0	0
Colorado	0	1	3	11	0	0	7	9
New Mexico	0	0	1	6	0	0	3	2
Arizona	0	1	4	0	0	0	2	6
Utah [2]	1	0	2	0	0	0	1	1
Pacific States:								
Washington	2	2	14	8	0	5	4	7
Oregon	0	2	4	7	2	1	6	4
California	3	2	48	34	5	4	9	11
	332	253	1,099	965	16	45	868	1,133

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Rocky Mountain spotted fever, week ended Aug. 26, 1933, 3 cases as follows: Maryland 2 and North Carolina 1.
[4] Typhus fever, week ended Aug. 26, 1933, 61 cases as follows: North Carolina, 1; South Carolina, 1; Georgia, 18; Florida, 5; Alabama, 28; Texas, 8.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
June 1933										
Hawaii Territory		16	5				0	2	0	5
July 1933										
Alabama	4	46	22	335	116	95	1	50	0	157
Delaware	1	5			19		2	6	0	9
Georgia	1	52	63	337	158	49	0	20	5	190
Idaho	4	1	11		8		1	10	8	12
Louisiana	2	32	29	193	50	56	3	33	0	121
North Carolina	5	58	4		399	137	1	104	0	171
Oklahoma	2	45	41	174	85	19	0	26	6	170
Oregon		5	45	3	161		1	58	29	23
Puerto Rico		34	93	2,823	121		0		0	28
South Carolina		146	376	1,120	330	372	0	10	2	204
Washington	1	5	20		163		2	49	20	17
Wisconsin	3	16	47		229		0	104	28	16

June 1933

	Cases
Hawaii Territory:	
Chicken pox	61
Conjunctivitis, follicular	29
Hookworm disease	38
Impetigo contagiosa	2
Leprosy	4
Mumps	51
Tetanus	3
Whooping cough	280

July 1933

	Cases
Anthrax:	
Delaware	1
Louisiana	1
Botulism:	
Washington	1
Chicken pox:	
Alabama	19
Delaware	7
Georgia	16
Idaho	9
Louisiana	2
North Carolina	33
Oklahoma [1]	11
Oregon	40
Puerto Rico	17
South Carolina	31
Washington	277
Wisconsin	440
Dengue:	
Alabama	2
Georgia	1
South Carolina	5
Diarrhea:	
South Carolina	1,130
Dysentery:	
Georgia (amebic)	8
Georgia (bacillary)	34
Louisiana	2
Oklahoma [1]	60
Oregon	2
Puerto Rico	264
Washington	1
Filariasis:	
Puerto Rico	3
German measles:	
North Carolina	7
Washington	5
Wisconsin	9
Hookworm disease:	
Georgia	80
Louisiana	28
South Carolina	97

July 1933—Continued

	Cases
Impetigo contagiosa:	
Oregon	12
Washington	1
Leprosy:	
Louisiana	1
Puerto Rico	3
Lethargic encephalitis:	
Alabama	3
South Carolina	1
Washington	4
Mumps:	
Alabama	20
Georgia	27
Louisiana	18
Oklahoma [1]	8
Oregon	11
Puerto Rico	21
South Carolina	40
Washington	57
Wisconsin	74
Ophthalmia neonatorum:	
Alabama	1
North Carolina	1
Puerto Rico	4
South Carolina	9
Wisconsin	1
Paratyphoid fever:	
Georgia	1
Louisiana	2
North Carolina	2
Oregon	2
South Carolina	7
Puerperal septicemia:	
Puerto Rico	10
Rabies in animals:	
Louisiana	5
Washington	9
Rabies in man:	
Alabama	1
Rocky Mountain spotted fever:	
Idaho	4
North Carolina	9
Oregon	4
Scabies:	
Oklahoma [1]	2
Oregon	7
Septic sore throat:	
Georgia	31
Louisiana	1
North Carolina	3
Oklahoma [1]	24
Oregon	2

July 1933—Continued

	Cases
Tetanus:	
Alabama	5
Georgia	3
Louisiana	5
Oklahoma [1]	1
Puerto Rico	18
South Carolina	2
Washington	1
Tetanus, infantile:	
Puerto Rico	14
Trachoma:	
Louisiana	1
Oklahoma [1]	3
Puerto Rico	1
Wisconsin	2
Tularaemia:	
Georgia	2
Louisiana	4
Oregon	1
South Carolina	1
Wisconsin	4
Typhus fever:	
Alabama	133
Delaware	1
Georgia	93
Louisiana	2
North Carolina	6
South Carolina	6
Undulant fever:	
Louisiana	2
Oklahoma [1]	1
Oregon	1
South Carolina	2
Washington	3
Wisconsin	2
Vincent's angina:	
Oklahoma [1]	1
Oregon	6
Washington	1
Whooping cough:	
Alabama	169
Delaware	25
Georgia	118
Idaho	4
Louisiana	36
North Carolina	743
Oklahoma [1]	33
Oregon	36
Puerto Rico	166
South Carolina	365
Washington	95
Wisconsin	1,614
Yaws:	
Puerto Rico	1

[1] Exclusive of Oklahoma City and Tulsa.

LETHARGIC ENCEPHALITIS IN THE UNITED STATES

Reports of cases of lethargic encephalitis are not received by telegraph, and current reports are incomplete. For the week ended August 26, 1933, the following reports were received before this issue of the Public Health Reports went to press:

State	*Cases*
Illinois	8
Indiana	1
Kansas	6
Oklahoma	5
West Virginia	2

The city of St. Louis reported 75 cases and 11 deaths for the week.

Reports from other localities were scattering and did not show epidemic prevalence anywhere except in St. Louis, city and county, Missouri.

WEEKLY REPORTS FROM CITIES

City reports for week ended August 19, 1933

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Maine:											
Portland	0	------	0	0	2	0	0	0	3	8	33
New Hampshire:											
Concord	0	------	0	0	1	0	0	0	0	0	7
Nashua	0	------	0	0	0	0	0	0	0	0	0
Vermont:											
Barre	0	------	0	0	0	0	0	0	0	1	4
Burlington	0	------	0	0	0	0	0	0	0	0	1
Massachusetts:											
Boston	4	1	0	6	10	20	0	11	0	53	106
Fall River	3	------	0	0	0	3	0	3	0	5	22
Springfield	0	------	0	0	1	2	0	0	0	4	24
Worcester	1	------	0	12	0	3	0	2	0	5	46
Rhode Island:											
Pawtucket	0	------	0	0	0	0	0	0	0	0	10
Providence	0	------	0	0	0	3	0	4	0	58	49
Connecticut:											
Bridgeport	0	------	0	3	1	2	0	2	0	2	18
Hartford	0	------	0	0	0	1	0	0	0	0	26
New Haven	0	------	0	0	1	0	0	1	0	7	29
New York:											
Buffalo	0	------	1	9	14	9	0	7	0	51	131
New York	16	1	6	16	82	9	0	78	29	140	1,051
Rochester	0	------	0	1	1	3	0	0	0	6	40
Syracuse	0	------	0	0	1	3	0	1	0	7	29
New Jersey:											
Camden	0	------	0	1	0	1	0	0	1	0	20
Newark	0	------	0	2	3	1	0	4	0	38	59
Trenton	0	------	0	0	2	0	0	2	0	3	21
Pennsylvania:											
Philadelphia	1	2	2	18	9	16	0	25	5	13	340
Pittsburgh	1	2	1	1	8	6	0	4	8	35	120
Reading	0	------	0	0	1	1	0	0	0	10	20
Ohio:											
Cincinnati	0	------	0	4	1	8	0	6	2	42	101
Cleveland	3	4	0	1	6	7	0	6	2	57	124
Columbus	2	1	1	1	0	11	0	6	0	4	67
Toledo	0	------	0	1	3	11	0	6	1	12	56
Indiana:											
Fort Wayne	1	------	0	0	0	0	0	0	0	1	18
Indianapolis	1	------	0	0	3	5	0	4	2	2	------
South Bend	0	------	0	0	1	1	0	0	0	1	17
Terre Haute	0	------	0	0	0	0	0	2	0	1	16
Illinois:											
Chicago	1	2	0	6	23	49	0	46	4	78	595
Michigan:											
Detroit	4	------	0	3	6	11	0	12	1	88	179
Flint	1	------	0	0	1	0	0	2	0	2	19
Grand Rapids	0	------	0	0	1	3	0	0	1	10	25
Wisconsin:											
Kenosha	0	------	0	0	0	0	0	0	0	9	8
Milwaukee	0	------	0	1	1	4	0	6	0	123	74
Racine	0	------	0	1	0	0	0	1	0	36	11
Superior	0	------	0	0	0	0	0	0	0	9	11
Minnesota:											
Duluth	0	------	0	1	1	1	0	3	0	11	23
Minneapolis	4	------	0	0	0	0	0	1	0	7	74
St. Paul	0	------	0	1	1	2	0	2	1	19	39
Iowa:											
Des Moines	4	------	------	0	------	4	0	------	0	0	19
Sioux City	1	------	------	0	------	1	0	------	0	4	------
Waterloo	2	------	------	0	------	0	0	------	0	4	------
Missouri:											
Kansas City	3	------	0	0	3	2	0	5	0	12	77
St. Joseph	0	------	0	1	0	1	0	0	0	1	21
St. Louis	8	------	------	6	5	3	0	5	1	10	173
North Dakota:											
Fargo	0	------	0	2	0	0	0	1	0	2	8
Grand Forks	0	------	0	0	0	0	0	0	0	0	0
South Dakota:											
Aberdeen	0	------	0	0	0	1	0	0	0	2	0
Nebraska:											
Omaha	1	------	0	2	9	3	0	1	0	4	47

City reports for week ended August 19, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Kansas:											
Topeka	0		0	0	1	0	0	1	0	3	4
Wichita	0		0	0	0	1	0	0	1	0	10
Delaware:											
Wilmington	1		0	0	1	0	0	0	1	0	22
Maryland:											
Baltimore	3	1	1	2	8	9	0	10	0	65	164
Cumberland	0		0	0	1	0	0	0	1	0	10
Frederick	0		0	0	0	0	0	0	0	0	2
District of Columbia:											
Washington	2		0	3	7	6	0	9	1	10	127
Virginia:											
Lynchburg	2		0	7	0	0	0	0	1	9	12
Norfolk	0		0	0	0		3	0	1	0	22
Richmond	3		0	0	1	3	0	2	0	2	
Roanoke	1		0	0	0	1	0	0	1	1	15
West Virginia:											
Charleston	2	2	1	0	0	3	0	0	0	0	14
Huntington	0		0	0	0	0	0	0	0	0	0
Wheeling	0		0	1	0	0	0	1	0	4	19
North Carolina:											
Raleigh	1		0	0	0	0	0	0	0	1	7
Wilmington	0		0	0	0	0	0	1	0	5	9
Winston-Salem	1		0	0	1	2	0	2	0	1	17
South Carolina:											
Charleston	0	7	0	0	0	0	0	1	1	1	16
Columbia	0		0	0	1	0	0	0	0	0	13
Greenville	0		0	0	0	0	0	1	0	1	5
Georgia:											
Atlanta	9	4	0	2	3	4	0	7	2	4	84
Brunswick	0		0	0	0	0	0	0	0	0	2
Savannah	1	8	0	0	0	0	0	2	0	3	23
Florida:											
Miami	0	1	0	0	1	0	0	1	1	0	17
Tampa	0	1	1	0	1	1	0	0	1	5	18
Kentucky:											
Ashland	1		0	0	0	1	0	0	3	0	
Lexington	0		0	0	0	1	0	2	0	1	21
Louisville	2	2	0	0	7	1	0	3	4	2	74
Tennessee:											
Memphis	4		1	2	3	1	0	5	3	3	75
Nashville	0		0	0	2	5	0	2	1	8	42
Alabama:											
Birmingham	2	1	0	0	2	2	0	5	6	2	66
Mobile	0		1	0	0	0	0	1	1	0	24
Montgomery	0			0		1	0		0	0	
Arkansas:											
Fort Smith	0			0		1	0		1	1	
Little Rock	0		0	0	2	1	0	0	0	0	
Louisiana:											
New Orleans	4	1	1	0	2	2	0	14	14	0	128
Shreveport	0		0	0	2	0	0	1	2	0	19
Oklahoma:											
Oklahoma City	1		0	0	2	1	0	2	2	0	36
Tulsa	0			1		1	0		1	2	
Texas:											
Dallas	6		0	1	0	1	0	5	5	0	54
Fort Worth	2		0	0	1	1	0	0	0	0	24
Galveston	0		0	0	2	0	0	0	2	0	8
Houston	2		0	0	4	0	0	4	0	3	60
San Antonio	2		0	0	3	0	0	4	0	0	60
Montana:											
Billings	0		0	0	0	0	0	0	0	0	6
Great Falls	0		0	0	0	0	0	0	0	5	3
Helena	0		0	0	0	0	0	0	0	0	4
Missoula	0		0	0	0	0	0	0	0	0	5
Idaho:											
Boise	0		0	0	1	0	0	0	1	1	9
Colorado:											
Denver	1	10	0	1	3	6	0	3	1	16	50
Pueblo	0		0	0	0	0	0	0	3	2	5
New Mexico:											
Albuquerque	0		0	0	1	0	0	1	0	2	12
Utah:											
Salt Lake City	0		0	5	2	4	0	1	0	6	30
Nevada:											
Reno	0		0	0	0	0	0	0	0	0	4

City reports for week ended August 19, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Washington:											
Seattle	0			1	2	3	0	4	1	15	83
Spokane	0			9	1	0	0		0	1	32
Tacoma											
Oregon:											
Portland	0		0	1	1	5	0	3	1	1	51
Salem	0		0	0	0	0	0	0	1	0	
California:											
Los Angeles	11	5	0	9	11	13	0	9	4	73	280
Sacramento			0	0	1	0	1	2	0	0	24
San Francisco	0		0	0	4	6	0	8	0	5	149

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Missouri:			
Boston			28	St. Louis	0	0	2
Worcester			3	North Dakota:			
New York:				Fargo	0	0	1
New York	1	0	102	Delaware:			
Syracuse	0	0	1	Wilmington	0	0	1
New Jersey:				Maryland:			
Newark	0	0	3	Baltimore	1	0	0
Trenton	0	0	1	Cumberland	0	0	1
Pennsylvania:				West Virginia:			
Pittsburgh	1	0	7	Wheeling	0	0	1
Ohio:				Georgia:			
Cleveland	1	0	3	Atlanta	0	0	1
Indiana:				Tennessee:			
Indianapolis	4	2	0	Memphis	0	0	1
Illinois:				Montana:			
Chicago	5	1	12	Missoula	0	0	1
Michigan:				Washington:			
Detroit	0	0	4	Seattle	0	0	3
Grand Rapids	1	0	0	Oregon:			
Minnesota:				Portland	0	0	2
Minneapolis	0	0	3				
St. Paul	0	0	1				

Typhus fever.—Cases: Charleston, S.C., 1; Atlanta, Ga., 3; Savannah, Ga., 2; Tampa, Fla., 2; and Birmingham, Ala., 1. Deaths: Savannah, Ga., 1.

Pellagra.—Cases: Bridgeport, Conn., 1; Washington, D.C., 1; Charleston, S.C., 3; Atlanta, Ga., 1; Savannah, Ga., 3; and Memphis, Tenn., 1.

Lethargic encephalitis.—Cases: New York, N.Y., 1; Detroit, Mich., 1; Kansas City, Mo., 1; St. Louis, Mo., 44.

Rabies in man.—Deaths: Wilmington, N.C., 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—Two weeks ended August 12, 1933.—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the 2 weeks ended August 12, 1933, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chicken pox		2		27	80	5	41		36	191
Diphtheria		6	7	19	13	7	1			53
Dysentery									1	1
Erysipelas				7	2	1	1		2	13
Influenza		15		1	1				11	28
Lethargic encephalitis				1						1
Measles				60	17	2	4		1	84
Mumps					41	7	7		7	62
Paratyphoid fever					9					9
Pneumonia		2			4		5		2	13
Poliomyelitis				6	6				2	14
Scarlet fever		7	5	36	33	13	2		10	106
Trachoma									4	4
Tuberculosis	3		32	107	63	17	7		42	271
Typhoid fever		2	5	60	27	1	3		1	99
Undulant fever					9					9
Whooping cough			7	153	281	90	24		15	570

Vital statistics—Year 1932.—The following table shows the number of births, deaths, and marriages reported in Canada during 1932, together with the deaths reported from certain causes. The figures are provisional.

Population (estimated)	10,493,000
Number of births	235,143
Birth rate per 1,000 population	22.4
Number of stillbirths	7,254
Infant mortality per 1,000 live births	73.2
Number of deaths	104,190
Death rate per 1,000 population	9.9
Number of marriages	62,514
Number of deaths from—	
Bronchitis	432
Cancer and other malignant tumors	10,014
Diabetes mellitus	1,342
Diarrhea and enteritis	3,734
Diphtheria	398
Erysipelas	228
Heart disease	15,320
Number of deaths from—Continued	
Influenza	4,220
Measles	[illegible]
Meningitis	878
Nephritis	5,631
Pneumonia	7,024
Poliomyelitis and polioencephalitis	163
Puerperal causes	1,180
Scarlet fever	196
Smallpox	17
Suicides	1,021
Tuberculosis, respiratory	5,836
Tuberculosis, other forms	1,287
Typhoid fever	336
Venereal diseases	542
Whooping cough	540

CUBA

Habana—Communicable diseases—4 weeks ended August 12, 1933.—During the 4 weeks ended August 12, 1933, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths
Diphtheria	10	3
Malaria	20	2
Tuberculosis	10	5
Typhoid fever	10	8

GREAT BRITAIN

Scotland—Vital statistics—Quarter ended June 30, 1933.—The Registrar General of Scotland has published the following statistics for the second quarter of the year 1933:

Population (estimated)	4,916,000
Births	23,212
Birth rate per 1,000 population	18 9
Deaths	15,121
Death rate per 1,000 population	12 3
Marriages	8,176
Deaths under 1 year	1,704
Deaths under 1 year per 1,000 births	73
Deaths from—	
Bronchitis	579
Broncho-pneumonia	470
Cancer	1,862
Cerebrospinal fever	56
Diabetes	154
Diphtheria	76
Dysentery	3
Erysipelas	48
Heart disease	2,494
Deaths from—Continued	
Influenza	135
Lethargic encephalitis	21
Measles	13
Nephritis, acute	69
Nephritis, chronic	266
Nephritis, unspecified	89
Pneumonia, lobar	319
Pneumonia, undefined	176
Poliomyelitis	6
Puerperal sepsis	43
Scarlet fever	52
Syphilis	24
Tetanus	3
Tuberculosis	1,043
Typhoid fever	5
Whooping cough	251

JAMAICA

Communicable diseases—Four weeks ended June 17, 1933.—During the 4 weeks ended June 17, 1933, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island of Jamaica, outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox		19	Leprosy	1	3
Diphtheria	1	1	Puerperal fever		5
Dysentery	7	20	Tuberculosis	34	78
Erysipelas		1	Typhoid fever	17	59

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Aug. 25, 1933, pp. 1056-1068. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Sept. 29, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

India—Chittagong.—During the week ended August 19, 1933, 1 case of cholera with 1 death was reported in Chittagong, India.

Philippine Islands.—During the week ended August 26, 1933, cholera was reported in the Philippine Islands as follows: Province of Cebu, Santa Fe, 2 cases; Province of Samar, Calbayog, 5 cases, 4 deaths; Santa Margarita, 10 cases, 5 deaths.

Plague

Egypt—Qena Province.—During the week ended August 19, 1933, 1 case of plague with 1 death was reported in Qena Province, Egypt.

Typhus Fever

Irish Free State—Lismore.—During the week ended August 12, 1933, 1 case of typhus fever was reported in Lismore, Waterford County, Irish Free State.

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A Review of Neuropsychiatric Service in a Marine Hospital
Deaths in Large Cities During the Week Ended August 26
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 48 SEPTEMBER 15, 1933 NO. 37

BONE MARROW IN TULARAEMIA [1]

By R. D. LILLIE, *Surgeon*, and EDWARD FRANCIS, *Medical Director, United States Public Health Service*

Bone marrow in animals dead of tularaemia has been under observation in our laboratory since May 11, 1929, during which time we have studied the marrow of the femur in the following animals infected in the laboratory: Blacktailed jackrabbit, *Lepus;* Cottontail rabbit, *Sylvilagus floridanus;* Belgian hare, *Oryctolagus cuniculus* (domesticated); Guinea pig, *Cavia cobaya;* California ground squirrel, *Otospermophilus grammurus beecheyi;* Cotton rat, *Sigmodon hispidus.*

The present article does not consider the lesions of tularaemia in organs other than marrow except for an occasional reference for purposes of comparison.

[1] From the National Institute of Health, Washington, D.C.

TABLE 1.—*The bone-marrow lesions of tularaemia in 5 species of rodents*

Number of animal	Date of death	Length of life (days)	Gross appearance of the marrow of femur	Smear of marrow of femur	Microscopic lesions of marrow	Bacteria in sections of marrow
LOT 1—BLACK-TAILED JACKRABBITS FROM KANSAS, INOCULATED MAY 27, 1930, SUBCUTANEOUSLY ON ABDOMEN WITH B. TULARENSE CULTURE R.R.P.						
668	May 30, 1930	3	Red, few small nodules		Scattered foci of necrosis	Clumps of coccoid organisms.
669	May 31, 1930	4	Studded with small nodules		Numerous foci of necrosis	Few organisms.
670	do	4	Thickly studded with nodules	Myriads of B. tularense	Multiple foci of necrosis	Great numbers coccobacillary organisms.
671	do	4	Very red and soft	do	Many small foci of necrosis	Numerous coccoid organisms.
672	June 1, 1930	5	Red, soft, and very spotted	Myriads of B. tularense A.M.M. 48555.	Numerous small foci of necrosis	Myriads minute coccoid organisms.
673	do	5	Very red and soft	Myriads of B. tularense	do	Myriads coccobacillary organisms.
674	do	5	Red, soft, spotted	do	Multiple foci of necrosis	Clumps of coccoid organisms.
LOT 2—DOMESTICATED RABBITS INOCULATED MAY 27, 1930, SUBCUTANEOUSLY ON THE ABDOMEN WITH B. TULARENSE CULTURE R.R.P.						
675	June 2, 1930	6	Firm and spotted	No bacteria identified	Scattered foci of necrosis	No organisms identified.
679	June 3, 1930	7	Firm, pink, and spotted	do	Numerous focal necroses	Do.
680	do	7	do	do	Multiple foci of necrosis	Do.
681	do	7	Firm, pink, few spots	do	Occasional small nodule	Do.
682	do	7	do	do	Few scattered nodules	Do.
LOT 3—GUINEA PIGS INOCULATED FROM LOT 1 OF BLACK-TAILED JACKRABBITS AT TIME OF DEATH MAY 30 TO JUNE 1, 1930						
678	June 2, 1930	6	Few spots	No bacteria identified	Scattered nodules	Scattered clumps coccoid organisms.
690	June 5, 1930	4	Pink, firm, no spots	do	Few focal lesions	No organisms identified.
691	do	5	do	do	1 small focal necrosis	Do.
692	do	5	No gross lesions	do	2 small focal necroses	Do.
693	do	5	do	do	Several focal necroses	Small clumps coccoid organisms.
694	do	5	Pink, firm, no gross lesions	do	Occasional small nodule	
695	do	6	do	do	Scattered small foci of necrosis	No organisms identified.
696	June 6, 1930	6	do	Few B. tularense	Numerous small foci of necrosis	Small clumps coccoid organisms.
697	June 7, 1930	5		No bacteria identified	4 focal necroses	Numerous clumps coccoid organisms.
698	June 9, 1930	7		do	Many scattered focal necroses	Few clumps coccobacillary organisms.

LOT 4—DOMESTICATED RABBITS INOCULATED FEB. 4, 1930, SUBCUTANEOUSLY ON THE ABDOMEN WITH B. TULARENSE CULTURE R.R.P.

000	Feb. 7, 1930	3	Very spotted (photo A.M.M. 48267).			
440	Feb. 8, 1930	4	Very spotted (photo A.M.M. 48268).	(Spleen, A.M.M. 48266; liver, A.M.M. 48265.)	Multiple focal necroses	No bacteria identified.
446	Feb. 10, 1930	6	Spotted		Numerous focal necroses	Do.

LOT 5—DOMESTICATED RABBITS WERE INOCULATED JUNE 28, 1929, ON THE NORMAL SKIN OF SACRAL REGION WITH B. TULARENSE CULTURE FI. SPU.

196	July 3, 1929	5			Scattered focal necroses	No bacteria identified.
197	July 4, 1929	6	Studded with nodules		Numerous focal necroses	Small clumps coccobacillary organisms.
199	July 6, 1929	8	do		do	Do.

LOT 6—WILD COTTONTAIL RABBITS FROM MARYLAND WERE INOCULATED MAY 6, 1929, ON THE NORMAL SKIN OF SACRAL REGION WITH B. TULARENSE CULTURE FI. SPU.

156	May 11, 1929	5			Many small foci of necrosis	Numerous coccobacillary organisms.
159	do	5	Studded with small nodules		Numerous focal necroses	Do.

LOT 7—WILD COTTONTAIL RABBITS FROM VIRGINIA WERE INOCULATED NOV. 14, 1930, ON THE NORMAL SKIN BETWEEN THE SHOULDERS WITH A MIXED SUSPENSION OF B. TULARENSE R.R.P., CAN. AND JEL.

897	Nov. 20, 1930	6	Red, soft, spotted	Myriads of coccoid forms	Many foci of necrosis	Clumps of coccoid organisms.

LOT 8—CALIFORNIA GROUND SQUIRRELS WERE INOCULATED AS INDICATED

						Method of inoculation:
3130	Mar. 11, 1933	5	Studded with small nodules	Many B. tularense		Rubbed on abdomen with Omo spleen.
3133	Mar. 12, 1933	6	do		Studded with foci of necrosis	Do.
3198	Mar. 20, 1933	14	Seemed to show few nodules	Few B. tularense	Multiple foci of necrosis	Rubbed on abdomen with Da spleen.
3242	Apr. 7, 1933	32	Soft, red, no nodules		No focal lesions	Do.
3296	Apr. 25, 1933	7	Studded with small nodules	No bacteria seen	Multiple foci of necrosis	Fed with Omo spleens and livers.
3299	Apr. 27, 1933	9	Seemed to show nodules	do		Do.

EXPLANATION OF TABLE 1

Table 1 (lots 1 and 2) places in marked contrast the bone-marrow lesions produced in two species of rabbit. Black-tailed jack rabbits (lot 1) showed a soft, red, very spotted bacteria-ladened marrow while the domesticated rabbits (lot 2) showed a firm pink almost bacteria-free marrow, both lots having been inoculated at the same time with the same culture of *B. tularense* (R.R.P.).

Guinea pigs (lot 3), although they were inoculated from the highly virulent tissues of lot 1 black-tailed jack rabbits, showed firm, pink, almost bacteria-free marrow like that of the domesticated rabbits. Histologically the guinea-pig marrow showed lesions which were not grossly visible.

Lot 4 of domesticated rabbits furnished the specimens for photographs of the gross lesions of marrow and spleen (plate I).

Lots 6 and 7 show the marrow lesions in the wild cottontail rabbits caught in Maryland and Virginia and infected in the laboratory.

Lot 8 presents the bone-marrow lesions produced in California ground squirrels caught in nature in California and shipped to Washington, D.C., where they were inoculated with tularaemia. Four were inoculated with the highly virulent strain Omo and two with the less virulent strain Da.

SURVIVAL OF B. TULARENSE IN THE MARROW OF REFRIGERATED RABBITS

Human cases of tularaemia frequently result from skinning and dressing wild rabbits kept in cold storage, particularly if a fragment of shattered bone pierces a finger, as may happen in the case of a market man or in those who skin rabbits for foxes raised for their furs.

Black-tailed jack rabbits (table 1, nos. 672, 673, and 674) were tested for survival of *B. tularense* in the bone marrow of the femur by placing the entire hind leg at time of death at a temperture of 3° C. for 1 month, at the end of which time the marrow was injected into guinea pigs and caused their death in 5 to 8 days with typical lesions of tularaemia—caseous inguinal lymph nodes and focal necroses of spleen and liver.

Wild cottontail rabbit no. 897 (table 1) and nine other cottontail rabbits were found to harbor virulent *B. tularense* in their marrow, some after 3 months and others after 4 months of refrigeration at 3° C.

One domesticated rabbit refrigerated 5 months at 3° C. and another domesticated rabbit frozen 8 months at a temperature of −15° C. still harbored virulent *B. tularense* in their marrow at the end of the times indicated.

The gross lesions of tularaemia were plainly evident in the marrow at the end of refrigeration as were also coccoid and bacillary forms of *B. tularense* in smears of the marrow.

PATHOLOGY

The only report of focal lesions in the bone marrow in the literature is that of Yamaguchi (1931), who stated that nodules were formed also in the adrenal cortex and bone marrow and showed distinct caseation. His report refers to experimentally infected guinea pigs dying between 5 and 15 days after inoculation.

In man, bone marrow has been examined only in three cases. Goodpasture and House (1928) noted the bone marrow of the femur and ribs as abundant and pink, grossly, but failed to include a histologic description. Bunker and Smith (1928) did not mention bone marrow in their report, but the senior author obtained a piece of rib from this case and could demonstrate no focal lesions in the red marrow. In a case (J.H.) of McKelvy's autopsied by Musser in November 1932 (personal communication), no focal lesions were seen in the bone marrow.

DOMESTIC RABBITS (*Oryctolagus cuniculus*)

Femoral bone marrow from 58 rabbits was available for histologic study. In 21 the fatal infection followed a single inoculation; in the remaining 37, 2 to 5 inoculations with living cultures of *B. tularense* preceded the fatal outcome. In 14 of the first group, survival was 7 days or less, and the lesions in the organs were of acute type, while the lesion type was generally acute only in 6 of the 37 which received multiple inoculations.

Grossly the marrow was noted as pink and firm and usually contained more or less numerous small, gray-white foci of necrosis (figs. 2, 3). These were absent grossly in 3 of the 21 animals infected by a single inoculation and, in 2 of these, foci were demonstrable histologically. The third, in which marrow lesions were absent, died after 66 days of subacute pulmonary tularaemia and the bone marrow was not infectious for guinea pigs. In the 37 animals which received multiple inoculations, focal necroses in the bone marrow were definitely recognizable grossly in 21, indefinite in 3, present histologically in all the foregoing and 7 more, and absent both grossly and histologically in 6. In these last the general infection was subacute in lesion type, and the interval of survival from the last inoculation was from 3 to 5 weeks, with one exception, an animal dying with definitely subacute lesions 4 days after his third inoculation. The interval from the second inoculation to death was 32 days, and it appears more probable that this was the fatal infection.

Histologically the lesions first appear as rounded foci of coagulative necrosis in which necrotic, but still distinctly granular, myelocytes (fig. 5) with pyknotic, lytic, or fragmenting nuclei, are imbedded in oxyphil granular and fibrillar material which failed to stain by Weigert's fibrin method. Marginal exudative or proliferative reaction is absent. These are the findings in animals dead on the third day after their first inoculation. The coagulated cells soon break down to amorphous granular debris (fig. 6), especially centrally; fibrillar material remains evident peripherally for some time. After a time vacuolated epithelioid cells appear peripherally (fig. 7) and may replace the caseous foci. Such granulomatous foci appeared in animals dying 7, 16, and 28 days after single inoculation and more frequently after multiple injections. However, focal necroses without marginal reaction are still frequently the only type seen, or constitute part of the lesions present, even in cases in which lesions in other viscera are definitely of the proliferative subacute type (table 2).

TABLE 2.—*Type of bone-marrow lesions in rabbits in acute and subacute tularaemia*

Classification of case on basis of other lesions	Single inoculations				Multiple inoculations				Total			
	Focal necroses	Granulomata	No lesions	Total	Focal necroses	Granulomata	No lesions	Total	Focal necroses	Granulomata	No lesions	Total
Acute	13	1	0	14	5	1	0	6	18	2	0	20
Subacute	4	2	1	7	12	13	6	31	16	15	7	88
All cases	17	3	1	21	17	14	6	37	34	17	7	58

Aside from the focal lesions, the marrow ordinarily contains few polymorphonuclear leucocytes or metamyelocytes. Myeloblasts are sometimes increased in numbers at the expense of the granular myelocytes, particularly in acute cases following single inoculations. Nodules of lymphoid cells often appear, especially in subacute cases following multiple inoculations. A more or less marked interstitial serous exudation (fig. 8) with or without congestion and hemorrhage, often appears, with material reduction in the cellularity and obliteration of the fat content of the marrow. This change is noted especially after multiple injections in both acute and subacute cases, and in late acute and subacute stages after single inoculations. Occasionally foci of interstitial fibrin deposition accompany this exudation. Scattered necrotic and karyorrhectic marrow cells throughout the marrow were associated with fibrinocaseous focal necroses in two instances.

GUINEA PIGS (*Cavia cobaya*)

Femoral bone marrow was studied grossly and histologically in 20 guinea pigs. Focal lesions were recognized grossly only in two as small grayish white nodules in the usually scanty, firm, pink

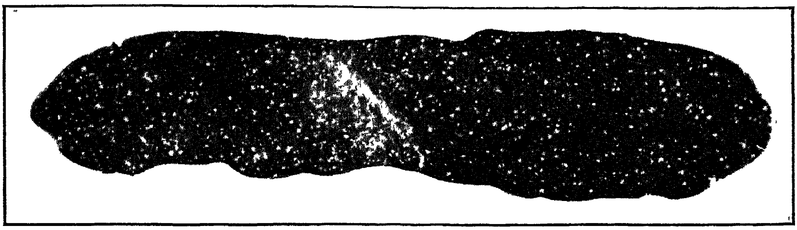

FIGURE 1.—Spleen of domesticated rabbit 440, dead fourth day, showing focal necrosis A.M.M. 48266.

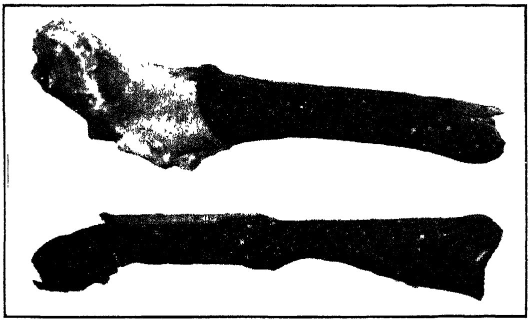

FIGURE 2.—Marrow of femurs of domesticated rabbit 440, dead fourth day, showing focal necrosis. A.M.M. 48268

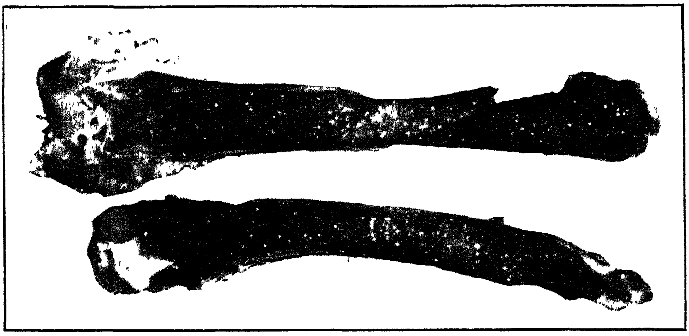

FIGURE 3.—Marrow of femurs of domesticated rabbit 000, dead third day, showing focal necrosis. A.M.M. 48267.

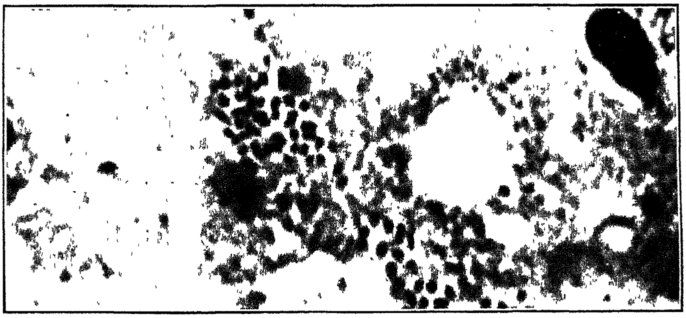

FIGURE 4.—Bacterium tularense in smear of marrow of femur of black-tailed jackrabbit 672, dead fifth day. A M.M. 48555.

FIG. 5

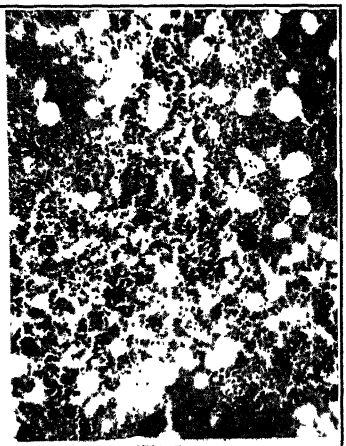

FIG. 6

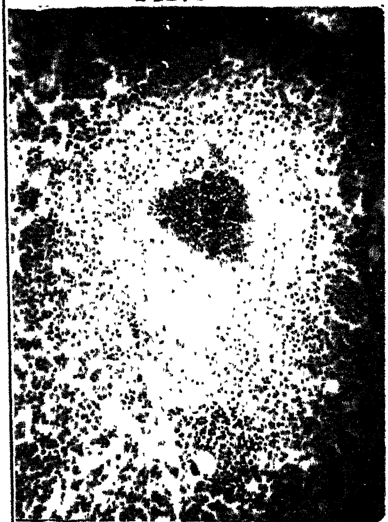

FIG. 7

FIG. 8

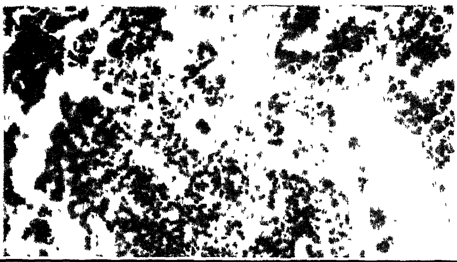

FIG. 9

FIGURE 5.—Focal coagulative necrosis, bone marrow, rabbit, 3 days. × 280.
FIGURE 6.—Focal necrosis, bone marrow, rabbit, 4 days. × 145
FIGURE 7.—Caseating granuloma, bone marrow, rabbit. Subacute tularaemia. × 145.
FIGURE 8.—Oedematous bone marrow in subacute tularaemia, rabbit. × 280.
FIGURE 9—Focal necrosis, bone marrow, guinea pig, 6 days. × 280. (All photographs reduced approximately ⅓ from the magnifications indicated)

FIG. 10

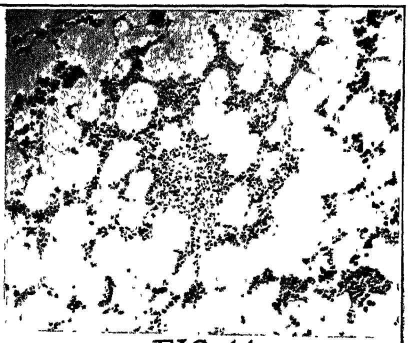

FIG. 11

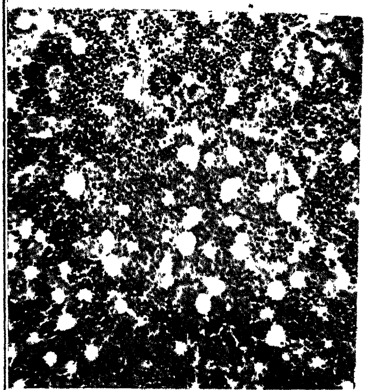

FIG. 12

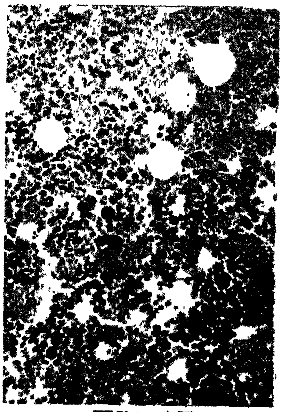

FIG. 13

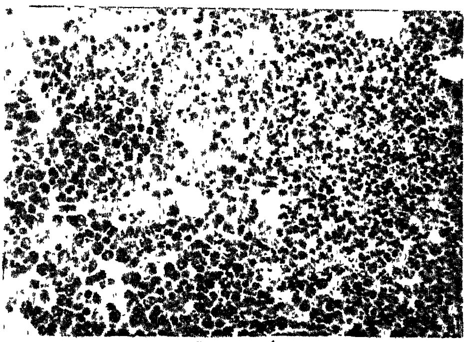

FIG. 14

FIGURE 10.—Small granuloma, bone marrow, guinea pig, 5 days. × 280.
FIGURE 11.—Focal necrosis, bone marrow, cottontail rabbit. × 150.
FIGURE 12.—Focal necrosis, bone marrow, black-tailed rabbit, 3 days × 145
FIGURE 13.—Margin of focal necrosis, bone marrow, black-tailed jackrabbit, 3 days × 280.
FIGURE 14.—Margin of focal necrosis, bone marrow, California ground squirrel, 6 days. × 280. (All photographs reduced approximately 1/3 from the magnifications indicated.)

marrow. Smears were made in 10, and only 1 (dying in 6 days) showed very few coccoid organisms.

Histologically, focal necroses were present in 18 animals, varying in number from 1 or 2 to numerous, usually designated as few, occasional, or scattered, being numerous only in 2 guinea pigs (dying in 6 and 7 days). They were absent in a guinea pig dead 4 weeks after inoculation and in 1 dead 10 days after the last of 3 successive inoculations with cultures of increasing virulence spread over a period of 3 months. Their size was usually 0.1 to 0.2 mm, occasionally 0.3 mm in diameter. Two general types are discerned. In one type are foci with contents of nuclear and granular oxyphil debris in which intact and fragmenting leucocytes are sometimes seen (3 of 11 animals) and in which no marginal proliferation is present (fig. 9). Coagulated rounded marrow cells persisted in the lesions in two of these animals. This type was seen in 11 animals dying after 5, 5, 5, 5, 5, 6, 6, 6, 7, 17, and 23 days. In the second type the lesions were composed of highly vacuolated epithelioid cells with karyolytic nuclei infiltrated by or surrounding central masses of nuclear and cellular debris, with recognizable intact or fragmenting leucocytes in 2 animals (5 days) (fig. 10). In two animals with this type of lesion there were also some of the first type without marginal proliferation. This granulomatoid type occurred in 7 guinea pigs dying after 4, 5, 5, 5, 5, 6, and 19 days. The granulomatoid type of lesion was less often seen in the bone marrow than in the spleens of the same animals. Scattered and clumped coccoid and coccobacillary organisms were identified in the lesions in 6 of 14 guinea pigs in which search was made.

Organisms were demonstrated outside of the focal lesions only in one guinea pig (dying in 6 days), where they occurred in scattered clumps in littoral cells, tissue spaces, and hyaline thrombi. Occasional hyaline thrombi without organisms were seen in one other animal (dying in 4 days). Granular myelocytes were often much reduced in numbers, being replaced by nongranular promyelocytes. Polymorphonuclear leucocytes were usually few in numbers, being increased in some of the animals in which leucocytes participated considerably in the focal lesions, and were more numerous in the two animals showing no focal lesions.

Cottontail Rabbits (*Sylvilagus floridanus*)

Marrow from the femur was examined in nine cottontail rabbits infected in 1929 and 1930. It was generally soft or almost diffluent, red, and more or less thickly studded with fine white foci of necrosis. Smears showed myriads of coccoid forms of *B. tularense*.

As six of these rabbits were kept in cold storage for some months before being autopsied in the course of the study of the survival of

the organisms in storage, material for histologic examination was saved only in the other three. These had died in 5, 5, and 6 days.

Histologically, the marrow was congested, contained many small hyaline thrombi, showed much diffuse cell degeneration and karyorrhexis, and was thickly studded with small foci (0.2 mm) of recent caseous necrosis filled with nuclear and cellular debris and showing no marginal exudative or proliferative reaction (fig. 11). There was an increase in promyeloid and lymphoid cells at the expense of the myelocytes, and polymorphonuclears were rare. Coccoid and coccobacillary organisms were very numerous, occurring in necrotic foci, in hyaline thrombi, in littoral cells, and in one rabbit diffusely in the tissue spaces. In one they were noted as fewer in necrotic foci.

It was in this species that we first encountered lesions of the bone marrow on May 11, 1929.

Cotton Rats (*Sigmodon hispidus*)

While the bone marrow was not studied grossly in cotton rats, marrow was encountered in the thyroid bone of 2 dying on the seventh day and in 1 a focus of recent caseating karyorrhectic necrosis without marginal reaction was found. There was a clump of small coccoid organisms in the margin of the lesion. In the other cotton rat the marrow showed karyolysis and some karyorrhexis, but no definite focal necroses and no organisms.

Black-Tailed Jackrabbits (*Lepus* sp.)

The bone marrow of the femur was studied in all of the seven black-tailed jackrabbits infected with tularaemia. Of these, 1 (puerpera) died in 3 days, 3 in 4 days, and 3 in 5 days. Grossly, the marrow was red and soft. In 2 animals focal necroses were not grossly evident, in 4 they were seen as numerous fine white points, and in 1 (3 days) spots were few and the marrow was relatively firm.

Smears of the marrow were made in 5 of the 7 jackrabbits, and in all myriads of *B. tularense* were present.

Histologically, the marrow was generally of a mixed cellular and fatty type, and moderate to marked congestion was present. Pseudoeosinophil myelocytes were the predominant cell type and showed variable grades of cell degeneration in different animals, cell vacuolation, loss of pseudoeosinophil granulation, karyorrhexis, irregular nuclear lobulation, and nuclear pyknosis being the principal changes observed. Numbers of normoblasts and pyknotic megakaryocytes were generally present. Moderate numbers of lymphocytes were seen in some animals. Many small hyaline thrombi were seen in the blood sinuses. Numerous focal necroses about 0.2 to 0.5 mm in diameter were present in all, fewest in the animal which died in 3 days (figs. 12 and 13). In some foci and in some animals coagu-

lated necrotic marrow cells with lytic or fragmenting nuclei formed the focus; in most instances these were replaced by nuclear fragments and granular oxyphil debris. In two animals (5 days) a delicate fibrin meshwork, not stained by Weigert's method, could be discerned either marginally or throughout the necrotic foci. Marginal proliferative reaction and cellular infiltration were absent.

Large numbers of minute coccoid organisms were present in all, clumps occurring in hyaline thrombi, free in the blood and tissue spaces, in reticulum cells, occasionally in megakaryocytes and lymphocytes and in the sheaths of vessels. In the focal necroses, especially centrally, organisms are poorly stained or not demonstrable, when stained, large numbers are demonstrated.

Opossums (*Didelphys virginiana*)

In the 11 opossums studied by the writers, bone marrow was unfortunately not saved in the 3 dying of acute tularaemia. In 4 others, killed 25 days to 7 weeks after infection, no focal lesions were found in the bone marrow of the femur.

California Ground Squirrels (*Otospermophilus grammurus beecheyi*)

Bone marrow was studied in 6 California ground squirrels dying 5, 6, 14, 32, 7, and 9 days after inoculation with virulent cultures.

Grossly, the femoral bone marrow was studded with numerous small white spots in the 3 animals dying in 5 to 7 days, these spots were dubious in the animal which died after 9 days, few at 14 days, and the marrow was normal in the animal which survived 32 days. Smears of the marrow showed numerous *B. tularense* in 1 animal (dying in 5 days) few in another (dying in 14 days), and none in 2 others (dying in 7 and 9 days after ingestion of virulent organs, 8 weeks after inoculation with a culture of low virulence).

Material for histologic study was prepared in 4 of the abovementioned animals (dying in 6, 14, 32, and 7 days). In the animal which survived the longest, focal lesions were absent but the marrow was packed with lymphoid or premyeloid cells containing vesicular nuclei and nucleoli, few granular myelocytes, and numerous megakaryocytes. In the other 3 there were multiple foci of necrosis which were conglomerate in the 14-day animal, and miliary in the other 2. They were composed of fragmented nuclei and cell debris, sometimes (6 days) fragmenting leucocytes, in one enmeshed in a close delicate feltwork of fibrin (fig. 14). Marginal proliferation and leucocyte infiltration were absent. In these three animals the marrow was composed chiefly of granular myelocytes. Megakaryocytes were fewest in the 6-day squirrel, more numerous in the others.

SUMMARY

Focal lesions are almost constantly present in the bone marrow in acute tularaemia in the five rodent species in which the marrow was systematically studied. They are frequent also in subacute tularaemia in rabbits and guinea pigs. The marrow focal lesions often become granulomatous in character in subacute tularaemia, but also often remain as simple focal necroses while lesions in other organs are granulomatous. There is a greater tendency to granulomatous reaction in rabbits the subject of repeated inoculation with living cultures of *B. tularense;* but in some of these in which marked granulomatous reactions were present in the lungs in a few days after the last inoculation, lesions are in all probability assignable to the inoculation made a month or more previously.

Aside from focal lesions there appears to be some destructive action affecting the more mature cell forms of the marrow.

It appears probable that focal lesions may be encountered in the bone marrow of human cases when a more extensive search is made.

Acknowledgment.—We are indebted to Maj. G. R. Callender and to Maj. J. E. Ash, who, as successive curators of the Army Medical Museum, made the four photographs comprising plate I.

NOTE.—We have also found foci of necrosis in the bone marrow of tularaemia-infected ground hogs, *Marmota flaviventer.*

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A NEUROPSYCHIATRIC SERVICE IN A MARINE HOSPITAL

Review of One Year's Work of the Clinic at Ellis Island

By J. D. REICHARD, *Surgeon, United States Public Health Service*

During the past few years, with the decline of immigration, the large number of vacant beds in the Ellis Island Hospital have been used for the care and treatment of regular Public Health Service beneficiaries. This has created a hospital with certain unique features. The opportunities and the demands of such a situation have justified the creation of a rather large neuropsychiatric service. This brief paper is an attempt to evaluate the worth of this service in the operation of this hospital.

The neuropsychiatric service of the United States marine hospital at Ellis Island is administered as an integral part of the hospital organization. Facilities are available for close and for normal supervision

of psychopathic patients, and there are open wards for patients requiring general hospital care. For patients in need of supervision, there are 46 beds, and for others, 50 beds.

The closed wards are of an old type but are quite adequate for purposes of observation and temporary detention. Their arrangement permits segregation of the more disturbed from the quiet, cooperative patients.

Patients admitted for diagnosis and treatment fall into two categories—voluntary patients, and those who can legally be held even though they desire to leave. Patients of the United States Immigration Service, and personnel of the United States Coast Guard are legally subject to detention, while all others are voluntary and must be discharged from hospital if and when discharge is requested. When a psychotic patient not subject to detention requests his discharge, the New York City police are notified and the patient is turned over to them for admission to the psychopathic division of Bellevue Hospital.

Prolonged treatment of chronic psychotic patients is not a function of the Public Health Service. Immigration patients are held until disposed of by that service. When civilian patients have a legal residence, an attempt is made to transfer them to their own States for care. Coast Guard patients and civilians without legal residence are transferred to St. Elizabeths Hospital in Washington, D.C., when it is apparent that prolonged treatment and institutional care are needed.

Nonpsychotic patients in need of prolonged care and treatment remain in the neuropsychiatric service or are transferred to the chronic ward of the hospital. As a result, there is a certain "clogging" and slowing up in the turn-over. However, this situation is identical with that encountered in all marine hospital work. Merchant seamen very frequently have no homes or families able to take care of them and, when incapacitated, must be cared for. In a civilian hospital, of course, these patients are returned to their homes when the maximal results from hospitalization are obtained, or are transferred to hospitals for chronics.

The Public Health Service is very fortunate in having the services of Dr. S. B. Wortis, assistant professor of neurology at New York University, as consultant in neurology. Dr. Wortis visits the hospital at a fixed time each week and holds clinics at which cases are presented and discussed. These clinics are open to the entire staff of the hospital, and are of great value in clarifying the organic aspects of our problems. During the past year, 162 patients have been presented at these clinics.

The volume of neurosurgery has so far not justified the organization of this special service. Patients in need of surgical treatment are transferred to Dr. Foster Kennedy's care at Bellevue Hospital, and

are returned to us for convalescence after the needed surgical work has been done.

A well-equipped library is maintained, periodicals are available, and many charts and models have been acquired.

During the past year an excellent 16-mm motion picture camera has been obtained and a series of motion pictures of neurological and psychiatric conditions is being collected. These are of great value in orienting beginners in the fields of neurology and psychiatry, and in demonstrating the differentiation between organic and "functional" conditions.

The work of keeping proper case histories and of recording findings and opinions is greatly facilitated by the use of a dictaphone. By its use, a permanent record of neurological and psychiatric conferences is kept.

During the past fiscal year, from July 1, 1932, to June 30, 1933, there were 571 discharges from the service. Of these, 187 were patients admitted from the Immigration Service for custodial care. These had all been diagnosed as psychotic in other hospitals and were held at Ellis Island pending deportation. They were not studied intensively by us. However, many of them were physically ill, and all required psychiatric care.

The remainder, 384, were admitted for diagnosis and treatment. The classification of these as to source, is as follows:

Seamen on American merchant vessels	174
Officers and enlisted men of the U.S. Coast Guard	34
Beneficiaries of the U.S. Employees' Compensation Commission	29
Personnel of the Public Health Service	2
Personnel of the Lighthouse Service	1
Immigration patients	144

The immigration patients are classified as to status as follows:

Warrant (i.e., aliens arrested for various reasons after entering the United States of America)	98
Alien passengers	38
Alien seamen	7
Stowaways	1

Ten patients at the end of the fiscal year had been on the service more than one year. The diagnoses of these patients were:

Encephalitis, hemorrhagic, traumatic	1
General paralysis, cerebral type (dementia paralytica)	3
Hemiplegia	1
Hydrocephalus, internal, traumatic	1
Syphilis, tertiary, of the central nervous system	3
Tabes dorsalis	1

The neuropsychiatric and related diagnoses made on the 384 discharges during the fiscal year are given in table 1. Other diagnoses, of course, were made and given careful consideration from the standpoint of the patient's problem, but are omitted for the sake of brevity.

TABLE 1.—*Neuropsychiatric and related diagnoses of 384 discharges from July 1, 1932, to June 30, 1933*

Adhesions, dural	1
Alcoholism, chronic (without psychosis)	8
Amnesia	8
Aphasia, motor, cerebral thrombosis	2
Aphasia, sensory, cerebral thrombosis	1
Arteriosclerosis, cerebral	8
Arteriosclerosis, general	13
Atrophy of brain	2
Atrophy, progressive muscular	1
Cicatrix, brain, traumatic	3
Constitutional psychopathic inferiority, without psychosis	18
Constitutional psychopathic state, criminalism	2
Constitutional psychopathic state, emotional instability	6
Constitutional psychopathic state, inadequate personality	17
Constitutional psychopathic state, paranoid personality	8
Deafness, unilateral, nerve, traumatic	4
Delirium, acute, cerebral malaria	1
Dementia praecox, hebephrenic type	10
Dementia praecox, paranoid type	13
Dementia praecox (mixed)	8
Drug addiction without psychosis, heroin	13
Drug addiction without psychosis, luminal	1
Dysphonia spastica	1
Encephalitis, acute, alcoholic	2
Encephalitis, traumatic, hemorrhagic	1
Encephalitis, lethargic, chronic	8
Encephalomyelitis disseminata	1
Epilepsy, grand mal	17
Epilepsy, petit mal	3
Epilepsy, post encephalitic	1
Epilepsy, Jacksonian	1
General paralysis, cerebral type (dementia paralytica)	15
Glioma of cerebellum	1
Headache, traumatic	1
Hematomyelia	1
Hemiplegia	6
Hemorrhage, sub-arachnoid, traumatic	1
Hydrocephalus, acquired, internal	3
Hypopituitarism	1
Hysteria	17
Meningitis, cerebral, posterior, basal, traumatic, hemorrhagic	1
Meningitis, spinal, serous, traumatic	1
Meningo-encephalitis	1
Mental deficiency, moron	9
Migraine	1
Myalgia, left sterno-cleido-mastoid muscle	1
Myelitis, transverse	2
Myelitis, lumbo-sacral	1
Myositis, chronic, left deltoid muscle	1
Myositis, ossificans	1
Neuralgia, toxic	2
Neuralgia, traumatic	1
Neuritis, multiple	1
Neuritis, optic	8
Neuritis, sciatic	2
Neuritis, external popliteal nerve	3
Neuritis, lumbo-sacral	1
Neuritis, caudo-equinal	1
Neurosis, anxiety	13
No diagnosis (insufficient time for observation)	16
No disease	31
Osteoarthritis, lumbar spine	2
Otitis interna, chronic	2
Pachymeningitis, cerebral, hemorrhagic, traumatic	1
Pachymeningitis, spinal, hemorrhagic, traumatic	1
Paralysis, agitans	2
Paralysis, facial nerve	2
Paralysis, oculo-motor nerve	1
Paralysis, right radial nerve	1
Psychosis, epileptic, deterioration	1
Psychosis, intoxication, acute hallucinosis (alcholic)	3
Psychosis, manic depressive, manic type	1
Psychosis, manic depressive, depressive type	2
Psychosis, senile, delirious and confused states	2
Psychosis, senile, depressed and agitated states plus deterioration	1
Psychosis, senile, paranoid states	2
Psychosis, senile, presenile types	1
Psychosis, traumatic, delirium	1
Psychosis, traumatic, post-traumatic enfeeblement	2
Psychosis with constitutional psychopathic inferiority	2
Radiculitis	5
Sclerosis, lateral, primary	1
Senility	14
Syphilis, tertiary (central nervous system not involved)	21
Syphilis, tertiary, central nervous system (general paralysis and tabes not included)	14
Tabes dorsalis	7
Thrombosis, posterior inferior cerebellar artery	2
Thrombosis, anterior cerebral artery	1
Thrombosis, middle cerebral artery	1
Thrombosis, pontine	1
Tumor, benign of cerebellum	1
Concussion of brain	5
Wound, lacerated, scalp	5
Alcohol (ethyl) poisoning, acute	10

Consultation service in neurology and psychiatry is furnished to our own hospital and to the marine hospital on Staten Island. During the year there were 110 consultations for other services in the Ellis Island Hospital and 189 for Staten Island. Patients seen in consultation who were in need of intensive study or special care by reason of some mental condition, were transferred to the neuropsychiatric service. Many persons suffering from functional disturbances were seen, but the limitations of bed capacity and of personnel trained in psychotherapeutic methods permitted the admission only of those in urgent need of care, or of those whose problems apparently could be rather promptly adjusted.

As a part of the consultation work for the hospital, many "disciplinary" problems are referred to us. Patients who are not adjusting to hospital routine fall, in general, into two rather sharply differentiated classes—first, those who are the victims of some mis-

understanding or unintentional injustice, and, second, psychopathic or frankly psychotic persons from whom a good adjustment cannot be expected. Persons in the first group present no great problem, while those in the second group are, of course, not benefited by the usual disciplinary measures.

All hospital patients suffering from drug addiction or from acute or chronic alcoholism are treated by the neuropsychiatric service. We do not expect, nor do we obtain, any permanent improvement in patients of this character, but a number of them, if hospitalized at intervals, are able to make a good economic adjustment.

A study of the diagnoses in table 1 shows that the material encountered differs from that met with either in a general or a psychopathic hospital. The large number of psychopathic personalities encountered is probably a reflection of a tendency for these persons to drift into the roving, wandering, irregular life of a seaman. We do not mean to imply that a seaman is necessarily unstable or psychopathic. On the contrary, the majority are stable, well-integrated personalities, functioning at a high level of adjustment. What is meant is that certain features of this occupation appeal strongly to psychopathic personalities, and offer them an outlet for their tendencies not found in the more stable and regular occupations.

The incidence of schizophrenia as compared to manic-depressive psychoses is quite high. This may be in part the result of an intensive search by the staff for schizoid mechanisms and a reluctance to diagnose a psychosis as manic-depressive when such mechanisms are present. However, this tendency does not explain entirely the great preponderance of the schizophrenias. It may be that the cyclo-thymic psychoses are so striking that persons suffering from them are hospitalized rather promptly in civilian hospitals and do not reach our service. The fact that there were seen no cases of catatonic praecox, another spectacular reaction type, tends to confirm this impression.

Many cases of conversion hysteria are seen. These patients may or may not have some organic disease, but all present motor or sensory disturbances which are obviously not on an organic basis. In nearly all cases the symptoms can be relieved temporarily or permanently by suggestion.

The number of anxiety neuroses discharged during the year represents only a small proportion of those encountered. The great majority could not be admitted because of lack of facilities. Apparently, neuroses are just as frequent among merchant seamen as in any other group.

An extremely mild type of syphilitic involvement of the central nervous system is encountered, characterized by a paretic colloidal

gold curve, positive Wassermann, a normal or slightly increased cell count, and with minimal detectable neurological or mental changes. Some of these are probably true but incipient cases of dementia paralytica seen much earlier than are those admitted to a psychopathic hospital. They offer an opportunity for the arrest of the process before the central nervous system sustains damage incompatible with economic and social adjustment, and every effort is made to retain these patients in hospital under intensive treatment.

It will be noted that the diagnosis of "malingering" was not made. Persons whose simulation of disease was apparently conscious, and not a true hysteria—that is, an unconscious simulation of organic disease—presented such marked deviations in personality as to make it obvious that the "malingering" was merely an accompanying and secondary symptom of psychopathy or mental deficiency.

An earnest attempt has been made to develop in all personnel an objective attitude toward deviations in behavior, and persons unable to maintain such an attitude are replaced as rapidly as possible. As a result of this policy, there are practically no disciplinary problems in the neuropsychiatric service. When *treatment* and not *punishment* is employed, psychotic and psychopathic patients are much quieter and usually promptly abandon aggressive activity. It is, of course, extremely difficult to maintain this objective attitude toward many psychopathic persons. They seem to have a rather strong drive to create hostility toward themselves, and to take advantage of a situation in order to picture themselves as the victims of injustice. This tendency and the resulting disturbances can be minimized by a steadily maintained and frequently expressed attitude that the patient is not being troublesome because he wants to, but because he cannot help it. By some peculiar slant of the psychopathic mind, this attitude places the patient on his mettle and he tries to prove the physician wrong by improving in emotional control.

In all psychiatric and neurological work, the individual as a whole, and as reacting and attempting to adjust to physical, mental, social, and economic situations, is the point of interest. It is recognized and constantly borne in mind that both from the personal and social viewpoints the important thing is not what physical or mental handicap a person may have, but how adequate his adjustment to it has been. Sometimes a physical handicap may be rectified and a person who is failing to adjust will then be able to carry on. Often, however, the physical burden cannot be lifted, and the attempt must be made to help the patient to function usefully in spite of the handicap. Frequently the overloading is on the mental side, and here the same formula holds. The load must be lightened or the individual strengthened if he is to function in a manner satisfactory to himself and to society.

With the idea in mind of the personality as a dynamic unit, the problems of the individual are approached from three main points of view—the neurological, in terms of damage to the central nervous system as the integrating organ of the personality; the psychological, in the sense of the amount of intelligence available for solving the individual's problems; and the psychiatric, the presence of abnormal thought processes and mental attitudes which interfere with integration and social adjustment.

The most difficult problems encountered are those in which the so-called "post-traumatic syndrome" is involved. By this is meant the person who has met some physical trauma, usually but not always to the head, and complains of headache, dizziness, and many other symptoms not characteristic of known organic disease. The neurological findings are negative and all other physical examinations are usually negative.

An exhaustive study of the patient's past life and present mental status is made, and a large number of these cases are found to be decidedly dull intellectually and give a life history indicating that this dullness has not developed following the injury, but has always been present. Others present a picture of a personality inadequate, unstable, or schizoid previous to the injury. Whether or not there are minute changes in brain tissue not detectable by present diagnostic means, the problem seems to be related closely to that of the "functional" diseases in general, namely, that a personality is capable of carrying a certain load and functioning normally. If this load is increased beyond the breaking point for that particular individual, either in the mental or physical aspects of the personality, integration is interfered with, and adjustment fails partially or completely.

The situation with relation to treatment is, of course, greatly complicated by economic factors. Most of these patients seen by us either have the possibility of collecting damages against some company or are compensable by the United States Employees' Compensation Commission, if their condition is believed to have been caused or aggravated by the injury.

The treatment of luetic cases is planned and supervised jointly by the neuropsychiatric and the urological services, and administered by the latter service. Fever treatment for syphilis of the central nervous system is given by means of an apparatus for administering radiant heat from incandescent bulbs. The body temperature is recorded by means of a thermocouple in the patient's rectum. Body temperatures of 106°–107° F. can be maintained for hours without serious discomfort or damage to the patient. Sufficient data have not yet been collected to indicate the value of this method as compared with malaria or other methods of elevating the temperature.

The therapeutic approach to mental conditions is along dynamic lines. The attempt is made first to understand the patient's difficulties and then to help him to understand and cope with them. As an adjunct in treatment, hypnosis is being tried in certain cases. No such startling and spectacular results as are reported by some workers have been found, and a considerable number of patients cannot be hypnotized. However, it is useful at times in uncovering buried memories, particularly as related to the conversion hysterias, and sometimes in dream interpretation. Some improvement is noted as a result of direct suggestion given while under hypnosis. It is an excellent method for strengthening *rapport* with a patient, and after hypnosis a patient will frequently talk quite freely about his difficulties. Its greatest use seems to be in promptly uncovering the buried memories of a functional amnesia.

It would seem that the creation of the neuropsychiatric service has proved to be a wise procedure; its operation, it is believed, has greatly increased the usefulness of the hospital by devoting special care and attention to a group of cases which give more than the usual concern, and it has served to stimulate in the professional personnel of the hospital, in general, a broader attitude toward their patients with a quicker recognition of problems which are unfortunately sometimes overlooked. It has proved of material assistance in the general discipline of the hospital. It has also rendered useful and worthy service in the handling of many difficult compensation cases. Altogether the first year's experiences with this clinic has in our judgment more than justified the expense involved in its creation.

COURT DECISIONS RELATING TO PUBLIC HEALTH

Occupational disease act upheld and construed.—(Illinois Supreme Court; *First Nat. Bank of Ottawa* v. *Wedron Silica Co.*, 184 N.E. 897, and *Madison* v. *Wedron Silica Co.*, 184 N.E. 901; decided Feb. 23, 1933.) Proceeding under the Occupational Disease Act, actions to recover damages because of the contraction of silicosis were brought by persons who had been employed by the defendant silica company. Section 1 of the said act provided, in substance, that every employer engaged in any work or process which may produce illness or disease peculiar to such work, or which subjects employees to illness or disease incident to such work to which employees are not ordinarily exposed in other lines of employment, should, for the employees' protection, adopt and provide reasonable and approved devices, means, or methods for preventing such industrial or occupational diseases. Section 2 declared certain specified employments to be especially dangerous to the health of employees engaged therein, and such section

and other portions of the act imposed certain detailed requirements upon employers, all with a view to the prevention of occupational diseases in such employments. For any injury to the health of any employee proximately caused by the willful violation of or the willful failure to comply with section 1, there was provided to the injured party a right of action for damages not exceeding $10,000. To all cases of occupational diseases arising out of the industries named in section 2, the provisions of the Workmen's Compensation Act were made applicable, such occupational diseases being given the status of accidental injuries arising out of and in the course of employment.

From judgments adverse to it in the trial court, the defendant company appealed to the supreme court. It was argued by the defendant that to permit employers enumerated in section 2 of the act to receive the benefit of a limited liability under the Workmen's Compensation Act and at the same time to impose a different liability upon those employers engaged in processes of manufacture other than those described in section 2 created a class out of a previously established class and subjected those classified under section 1 to greater burdens than those enumerated under section 2. But the supreme court took the view that it was unable to say that the legislature did violence to the State or Federal constitution when it provided different remedies for the different classes of industries. It also held that the act did not bestow any special privilege by special legislation contrary to section 22 of article 4 of the State constitution, saying that "The provisions of the act respecting each class impinge uniformly upon all within the class."

Respecting a point raised by the defendant as to the period within which an action for damages under the act should be commenced, the appellate court said:

> * * * The statute of limitations does not commence to run until the right of action arises. That arises upon disablement—i. e., when the occupational disease puts him [the employee] in such a condition that he must quit work.

DEATHS DURING WEEK ENDED AUGUST 26, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Aug. 26, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	6,463	6,601
Deaths per 1,000 population, annual basis	9.0	9.4
Deaths under 1 year of age	451	578
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	39	48
Deaths per 1,000 population, annual basis, first 34 weeks of year	11.1	11.4
Data from industrial insurance companies:		
Policies in force	67,759,927	71,074,390
Number of death claims	11,363	11,304
Death claims per 1,000 policies in force, annual rate	8.7	8.3
Death claims per 1,000 policies, first 34 weeks of year, annual rate	10.1	9.8

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended September 2, 1933, and September 3, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 2, 1933, and Sept. 3, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Sept. 2, 1933	Week ended Sept. 3, 1932	Week ended Sept. 2, 1933	Week ended Sept. 3, 1932	Week ended Sept. 2, 1933	Week ended Sept. 3, 1932	Week ended Sept. 2, 1933	Week ended Sept. 3, 1932
New England States:								
Maine		3		9	3	5	0	0
New Hampshire					2		0	0
Vermont	1	3				1	0	0
Massachusetts	12	19		2	31	32	3	0
Rhode Island	1					3	0	0
Connecticut	1	11	2		7	7	0	0
Middle Atlantic States:								
New York [3]	20	38	[1] 1	[1] 4	39	80	2	3
New Jersey	3	9	2	2	15	39	1	1
Pennsylvania	39	41			38	51	7	5
East North Central States:								
Ohio	24	15	28	6	16	24	1	4
Indiana	14	23	26	10	3	7	1	0
Illinois [3]	11	34		25	13	20	2	1
Michigan	14	8			8	39	1	3
Wisconsin	1	12	19	39	11	29	0	2
West North Central States:								
Minnesota	8	4	1	2	4	4	0	1
Iowa [4]	10	3					0	0
Missouri	18	20			15	2	0	0
North Dakota	13	1	3		8	2	0	0
South Dakota	2						0	0
Nebraska	5	4				3	0	0
Kansas	9	14			5	8	1	2
South Atlantic States:								
Delaware	1	1	1		2		1	0
Maryland [2,4]	3	7	7	1	4	4	1	1
District of Columbia	3	2			1		0	1
Virginia	28	20			9	5	3	0
West Virginia	33	35	12		10	18	2	0
North Carolina [2]	62	41	7	12	13	20	0	1
South Carolina [3]	8	14	92	102	44	2	0	0
Georgia [2,3]	36	23		19	24	1	0	0
Florida	16	25		3	10	3	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 2, 1933, and Sept. 3, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Sept. 2, 1933	Week ended Sept. 3, 1932	Week ended Sept. 2, 1933	Week ended Sept. 3, 1932	Week ended Sept. 2, 1933	Week ended Sept. 3, 1932	Week ended Sept. 2, 1933	Week ended Sept. 3, 1932
East South Central States:								
Kentucky	42	42	-------	4	-------	4	1	1
Tennessee	21	37	10	6	3	1	0	1
Alabama [3]	50	50	4	6	31	1	0	2
Mississippi [4]	28	23	-------	-------	-------	-------	0	0
West South Central States:								
Arkansas	17	23	1	6	40	6	0	0
Louisiana	17	20	8	6	-------	3	1	3
Oklahoma [5]	20	39	5	5	-------	-------	0	1
Texas [3]	87	87	56	16	11	4	0	0
Mountain States:								
Montana	3	-------	3	-------	4	27	0	0
Idaho	-------	-------	-------	-------	1	-------	0	0
Wyoming [2]	-------	1	1	1	1	3	0	0
Colorado	3	6	-------	-------	6	5	0	0
New Mexico	10	8	-------	-------	2	-------	0	1
Arizona	-------	3	4	1	-------	3	0	0
Utah [4]	-------	2	-------	-------	4	2	0	0
Pacific States:								
Washington	3	3	-------	-------	5	7	0	0
Oregon	1	2	5	11	13	8	0	0
California	39	13	10	82	43	23	1	1
Total	737	789	314	380	499	506	29	35

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Sept. 2, 1933	Week ended Sept. 3, 1932	Week ended Sept. 2, 1933	Week ended Sept. 3, 1932	Week ended Sept. 2, 1933	Week ended Sept. 3, 1932	Week ended Sept. 2, 1933	Week ended Sept. 3, 1932
New England States:								
Maine	3	0	2	9	0	0	3	3
New Hampshire	0	0	1	2	0	0	0	1
Vermont	3	0	4	5	0	0	0	0
Massachusetts	32	2	64	55	0	0	4	9
Rhode Island	1	0	6	3	0	0	1	0
Connecticut	11	3	9	9	0	0	5	2
Middle Atlantic States:								
New York [2]	164	20	72	77	0	8	52	45
New Jersey	14	33	21	26	0	0	6	11
Pennsylvania	50	113	111	134	0	0	48	92
East North Central States:								
Ohio	22	6	90	144	1	0	51	100
Indiana	4	0	22	20	0	1	14	20
Illinois [3]	14	11	83	58	1	2	40	35
Michigan	8	7	35	46	0	1	22	23
Wisconsin	1	1	22	15	5	0	0	8
West North Central States:								
Minnesota	31	11	20	17	0	0	3	3
Iowa [4]	3	3	9	5	0	2	5	8
Missouri	1	0	17	28	0	0	12	30
North Dakota	10	0	4	4	0	0	3	8
South Dakota	1	1	1	3	0	0	4	3
Nebraska	0	0	1	7	0	0	0	1
Kansas	5	6	28	19	1	1	14	24
South Atlantic States:								
Delaware	0	8	3	4	0	0	1	1
Maryland [3,4]	2	1	17	30	0	0	27	27
District of Columbia	0	8	2	6	0	0	1	6
Virginia	3	1	25	33	0	0	42	38
West Virginia	3	4	42	23	0	0	57	87
North Carolina [3]	1	1	70	45	0	1	30	86
South Carolina [3]	1	2	8	7	0	0	20	41
Georgia [3,5]	1	0	4	12	1	0	53	72
Florida	0	0	1	3	0	0	2	6

See footnote at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 2, 1933, and Sept. 3, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended 2, 1933	Week ended 3, 1932	Week ended 2, 1933	Week ended 3, 1932	Week ended 2, 1933	Week ended 3, 1932	Week ended 2, 1933	Week ended 3, 1932
East South Central States:								
Kentucky	1	0	62	34	0	0	52	98
Tennessee	7	4	42	40	0	0	46	74
Alabama [3]	1	5	18	32	0	1	26	33
Mississippi [4]	0	0	7	10	0	0	10	23
West South Central States:								
Arkansas	0	2	7	7	2	0	16	23
Louisiana	1	2	12	9	0	0	21	39
Oklahoma [5]	0	2	4	11	0	0	17	49
Texas [3]	1	0	43	19	2	0	41	82
Mountain States:								
Montana	0	0	6	7	0	3	1	6
Idaho	0	0	0	1	0	0	3	0
Wyoming [2]	0	0	6	7	0	1	1	1
Colorado	0	0	12	10	1	0	15	13
New Mexico	1	1	2	13	0	0	15	4
Arizona	0	0	2	3	3	0	5	1
Utah [4]	0	0	0	5	0	0	2	1
Pacific States:								
Washington	3	0	12	25	1	6	4	8
Oregon	0	0	11	3	2	1	5	8
California	2	9	54	40	3	4	8	6
Total	401	262	1,089	1,125	23	32	808	1,209

[1] New York City only.
[2] Rocky Mountain spotted fever, week ended Sept. 2, 1933, 9 cases, as follows: New York, 2; Maryland, 1; North Carolina, 3; Georgia, 2; Wyoming, 1.
[3] Typhus fever, week ended Sept. 2, 1933, 67 cases, as follows: Illinois, 1; South Carolina, 6; Georgia, 26; Alabama, 21; Texas, 13.
[4] Week ended earlier than Saturday.
[5] Exclusive of Oklahoma City and Tulsa

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
July 1933										
Kansas	1	22	1	2	53		9	60	0	48
Mississippi	1	36	384	7,602	247	891		29	4	97
Nevada		1			5		0	3	4	2
Virginia	6	45	111	36	270	42	3	101	1	236

July 1933	Cases
Chicken pox:	
Kansas	10
Mississippi	103
Nevada	2
Virginia	30
Dengue:	
Mississippi	8
Diarrhea and dysentery:	
Virginia	1,385
Dysentery:	
Mississippi (amebic)	73
German measles:	
Kansas	13
Hookworm disease:	
Mississippi	652
Impetigo contagiosa:	
Kansas	1
Lethargic encephalitis:	
Kansas	6
Mumps:	
Kansas	68
Mississippi	87
Virginia	54
Ophthalmia neonatorum:	
Kansas	1
Virginia	1
Paratyphoid fever:	
Virginia	20
Puerperal septicemia:	
Mississippi	21
Rabies in animals:	
Mississippi	4
Rocky Mountain spotted fever:	
Nevada	3
Virginia	11
Scabies:	
Kansas	1
Septic sore throat:	
Kansas	3
Nevada	1
Virginia	19
Tetanus:	
Kansas	4
Virginia	4
Trachoma:	
Mississippi	1
Virginia	3
Trench mouth:	
Kansas	1
Tularaemia:	
Nevada	4
Virginia	4
Typhus fever:	
Virginia	3
Undulant fever:	
Kansas	2
Mississippi	1
Virginia	7
Vincent's angina:	
Kansas	1
Whooping cough:	
Kansas	289
Mississippi	1,048
Nevada	6
Virginia	319

LETHARGIC ENCEPHALITIS, ST. LOUIS, MO.

From July 31 to September 6, 1933, 343 cases of lethargic encephalitis with 49 deaths were reported in the county of St. Louis, Mo., and 235 cases and 28 deaths in the city of St. Louis. The totals for the city and county were 578 cases and 77 deaths.

WEEKLY REPORTS FROM CITIES

City reports for week ended Aug. 26, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	-------	0	0	1	1	0	1	1	1	23
New Hampshire:											
Concord	0	-------	0	0	1	1	0	0	0	0	9
Nashua	0	-------	0	0	0	0	0	0	0	0	0
Vermont:											
Burlington	0	-------	0	0	0	0	0	0	0	0	13
Massachusetts:											
Boston	4	-------	0	13	8	21	0	13	3	36	175
Fall River	1	-------	0	0	1	1	0	2	0	0	24
Worcester	0	-------	0	8	5	2	0	1	0	4	39
Rhode Island:											
Pawtucket	0	-------	0	0	0	0	0	0	0	0	14
Providence	0	-------	0	6	2	6	0	1	0	17	54
Connecticut:											
Bridgeport	1	1	1	0	1	4	0	0	1	0	25
Hartford	0	-------	0	0	0	2	0	1	0	1	32
New Haven	2	-------	1	0	0	1	0	0	0	10	33
New York:											
Buffalo	0	-------	0	5	7	5	0	5	3	27	97
New York	14	3	3	10	60	16	0	69	21	133	1,090
Rochester	0	-------	0	0	2	1	0	1	0	2	57
Syracuse	0	-------	0	0	2	0	0	0	1	15	41
New Jersey:											
Camden	0	-------	0	0	0	2	0	1	1	0	21
Newark	0	1	0	0	3	1	0	10	0	34	88
Trenton	0	1	0	0	0	1	0	1	0	4	23
Pennsylvania:											
Philadelphia	2	2	2	15	12	12	0	29	1	9	352
Pittsburgh	1	-------	0	2	8	8	0	2	2	60	103
Reading	1	-------	0	0	1	0	0	1	0	6	16
Ohio:											
Cincinnati	1	-------	1	2	5	8	0	7	0	26	100
Cleveland	1	16	1	1	5	7	0	7	4	25	161
Columbus	0	-------	0	0	1	10	0	1	3	0	65
Toledo	1	-------	0	0	2	12	0	4	1	8	68
Indiana:											
Fort Wayne	1	-------	0	0	2	0	0	1	0	1	27
Indianapolis	0	-------	0	1	2	4	0	3	4	6	-------
South Bend	1	-------	0	0	2	3	0	0	0	1	16
Terre Haute	2	-------	0	0	0	1	0	0	1	0	8
Illinois:											
Chicago	1	-------	0	6	23	43	0	34	2	61	563
Springfield	0	-------	0	0	0	0	0	0	1	1	21
Michigan:											
Detroit	13	1	0	4	3	6	0	14	9	53	212
Flint	0	-------	0	0	2	1	0	0	0	4	26
Grand Rapids	0	-------	0	0	0	4	0	1	0	2	20
Wisconsin:											
Kenosha	0	-------	0	0	0	0	0	1	0	0	7
Madison	0	-------	0	0	0	0	0	0	0	6	-------
Milwaukee	1	-------	0	0	3	4	0	4	0	125	77
Superior	0	-------	0	0	0	0	0	0	0	0	9
Minnesota:											
Duluth	0	-------	0	8	0	1	0	0	0	7	11
Minneapolis	6	-------	0	2	1	3	0	2	0	1	76
St. Paul	0	-------	0	0	3	3	0	0	0	22	58
Iowa:											
Des Moines	6	-------	0	0	0	3	0	0	0	0	28
Sioux City	0	-------	0	0	0	2	0	0	0	1	0
Waterloo	0	-------	0	0	0	0	0	0	0	3	-------

City reports for week ended Aug. 26, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Missouri:											
Kansas City	0	-------	0	0	0	2	0	3	1	4	86
St. Joseph	0	-------	0	1	3	2	0	1	0	1	22
St. Louis	4	1	-------	0	2	3	0	11	10	8	170
North Dakota:											
Fargo	0	-------	0	1	1	0	0	0	1	2	14
Grand Forks	0	-------	0	0	0	0	0	0	0	0	0
South Dakota:											
Sioux Falls	0	-------	0	0	0	0	0	0	2	0	7
Nebraska:											
Omaha	0	-------	0	0	1	8	0	1	0	7	43
Kansas:											
Topeka	1	-------	0	1	1	0	0	0	0	4	14
Wichita	1	-------	0	0	0	3	0	1	0	5	9
Delaware:											
Wilmington	0	-------	0	0	0	1	0	0	0	1	11
Maryland:											
Baltimore	1	3	1	0	2	6	0	7	2	41	145
Cumberland	0	-------	0	0	0	0	0	0	0	0	13
Frederick	0	-------	0	0	0	2	0	0	0	0	3
District of Columbia:											
Washington	4	1	1	3	3	4	0	8	3	12	116
Virginia:											
Lynchburg	0	-------	0	6	0	0	0	2	0	6	16
Richmond	1	-------	0	1	0	1	0	1	1	0	33
Roanoke	0	-------	0	0	1	2	0	0	0	2	18
West Virginia:											
Charleston	0	-------	0	0	0	2	0	1	1	2	21
Huntington	0	-------	0	0	0	0	0	0	0	0	0
Wheeling	0	-------	0	2	0	2	0	0	3	1	10
North Carolina:											
Raleigh	0	-------	0	0	0	0	0	0	0	2	9
Wilmington	0	-------	0	0	0	1	0	0	0	0	10
Winston-Salem	7	1	1	5	2	4	0	2	0	1	17
South Carolina:											
Charleston	0	3	0	0	0	0	0	4	0	4	27
Columbia	0	-------	0	0	0	0	0	1	0	0	26
Greenville	0	-------	0	0	1	0	0	1	1	0	6
Georgia:											
Atlanta	11	3	1	0	4	2	0	3	[1] 6	4	64
Brunswick	0	-------	0	0	0	0	0	1	1	0	5
Savannah	1	2	0	1	1	2	0	1	1	1	25
Florida:											
Miami	2	-------	0	1	0	0	0	2	0	5	20
Tampa	4	-------	0	0	0	1	0	5	2	0	25
Kentucky:											
Ashland	0	-------	0	0	0	0	0	0	0	8	0
Lexington	0	-------	0	0	1	0	0	2	1	0	17
Louisville	0	1	0	0	5	1	0	1	3	0	67
Tennessee:											
Memphis	1	-------	0	0	4	2	0	6	4	0	73
Nashville	3	-------	0	0	0	4	0	2	1	2	45
Alabama:											
Birmingham	6	-------	1	0	2	2	0	3	2	0	61
Mobile	1	-------	0	0	0	0	0	5	0	0	19
Montgomery	0	-------	-------	0	-------	0	0	-------	1	1	-------
Arkansas:											
Fort Smith	0	-------	0	0	0	0	0	0	0	0	6
Little Rock	0	-------	0	0	3	2	0	1	1	0	8
Louisiana:											
New Orleans	15	4	4	0	4	4	0	9	7	1	126
Shreveport	0	-------	0	0	1	1	0	2	0	0	25
Oklahoma:											
Oklahoma City	1	-------	0	0	0	2	0	1	0	0	38
Tulsa	0	-------	0	0	0	0	0	0	0	2	0
Texas:											
Dallas	6	-------	0	0	0	1	0	3	1	5	62
Fort Worth	0	-------	0	0	1	0	0	2	0	0	32
Galveston	2	-------	0	0	1	0	0	0	0	0	13
Houston	7	-------	0	0	5	1	0	2	1	0	56
San Antonio	3	-------	0	0	0	2	0	5	0	0	48

[1] 2 nonresidents.

City reports for week ended Aug. 26, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Montana:											
Billings	0	-------	0	0	0	0	0	0	0	0	5
Great Falls	0	-------	0	0	0	0	0	0	0	3	7
Helena	0	-------	0	0	0	0	0	0	0	0	5
Missoula	0	-------	0	0	0	0	0	0	0	0	2
Idaho:											
Boise	0	-------	0	0	0	0	0	0	0	1	2
Colorado:											
Denver	0	11	1	0	5	0	0	5	1	17	69
Pueblo	0	-------	0	1	1	2	0	0	0	0	10
New Mexico:											
Albuquerque	0	-------	0	0	1	0	0	3	1	0	16
Utah:											
Salt Lake City	0	-------	0	8	0	2	0	2	0	10	23
Nevada:											
Reno	0	-------	0	0	0	0	0	0	0	0	2
Washington:											
Seattle	0	-------	-------	2	-------	7	0	-------	0	17	-------
Spokane	0	-------	-------	5	-------	0	0	-------	0	0	17
Tacoma	0	-------	0	0	3	1	0	0	0	6	31
Oregon:											
Portland	1	-------	0	1	6	1	1	5	1	2	69
Salem	0	-------	0	0	0	0	0	0	0	2	0
California:											
Los Angeles	14	10	1	1	6	9	1	18	1	59	227
Sacramento	-------	-------	0	0	1	1	0	4	0	1	23
San Francisco	1	1	2	1	5	7	0	6	0	11	141

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Minnesota:			
Boston	0	0	29	Duluth	0	0	1
Fall River	0	0	1	Minneapolis	0	0	2
Worcester	0	0	3	St. Paul	0	0	1
Rhode Island:				Missouri:			
Providence	0	0	1	St. Joseph	1	0	0
New York:				St. Louis	0	0	2
Buffalo	0	0	2	North Dakota:			
New York	8	5	89	Fargo	0	0	3
Rochester	0	0	1	Kentucky:			
New Jersey:				Louisville	0	0	1
Newark	0	0	5	Tennessee:			
Pennsylvania:				Memphis	0	0	2
Pittsburgh	1	0	11	Louisiana:			
Reading	0	1	0	New Orleans	2	1	1
Ohio:				Utah:			
Cincinnati	0	0	2	Salt Lake City	0	0	1
Cleveland	0	0	6	Washington:			
Illinois:				Seattle	2	0	2
Chicago	3	0	14	California:			
Michigan:				Los Angeles	3	1	2
Detroit	0	0	3				

Lethargic encephalitis.—Cases: Bridgeport, Conn., 1; Camden, N.J., 1; Cleveland, 3; Chicago, 1; Detroit, 1; Duluth, 1; Kansas City, Mo., 2; St. Louis, 75; Fargo, N.Dak., 2; Omaha, 2; Charleston, S.C., 1; Dallas, Tex., 1.

Typhus fever.—Cases: Charleston, S.C., 2; Savannah, 3; Tampa, 2; Mobile, 1.

Pellagra.—Cases: Charleston, S.C., 1; Birmingham, 2; New Orleans, 1; Los Angeles, 2.

Rabies in man.—Deaths: Memphis, 1.

FOREIGN AND INSULAR

CANADA

Quebec Province—Communicable diseases—2 weeks ended August 26, 1933.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended August 26, 1933, as follows:

Disease	Cases	Disease	Cases
Chicken pox	23	Poliomyelitis	4
Diphtheria	32	Scarlet fever	49
Erysipelas	6	Tuberculosis	114
Influenza	1	Typhoid fever	84
Lethargic encephalitis	1	Whooping cough	168
Measles	28		

CZECHOSLOVAKIA

Communicable diseases—June 1933.—During the month of June 1933, certain communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	4		Paratyphoid fever	11	
Cerebrospinal meningitis	11	4	Poliomyelitis	15	2
Chicken pox	452		Puerperal fever	35	23
Diphtheria	1,861	75	Scarlet fever	2,149	23
Dysentery	6	1	Trachoma	123	
Influenza	42	6	Typhoid fever	319	21
Lethargic encephalitis	2		Typhus fever	9	

JAMAICA

Communicable diseases—Four weeks ended July 15, 1933.—During the 4 weeks ended July 15, 1933, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island of Jamaica, outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis		1	Puerperal fever		3
Chicken pox		3	Scarlet fever	1	1
Diphtheria	3	1	Tuberculosis	35	70
Dysentery	9	10	Typhoid fever	19	83
Erysipelas		1			

MEXICO

Tampico—Communicable diseases—July 1933.—During the month of July 1933, certain communicable diseases were reported in Tampico, Mexico, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Chicken pox	1		Paratyphoid fever		3
Enteritis, various		43	Scabies	1	
Erysipelas	3		Tuberculosis	25	22
Influenza	25		Typhoid fever	8	4
Malaria	249	5	Whooping cough	33	1
Measles	54	11			

PANAMA CANAL ZONE

Communicable diseases—April–June 1933.—During the months of April, May, and June 1933, certain communicable diseases, including imported cases, were reported in the Panama Canal Zone and terminal cities as follows:

Disease	April		May		June	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chicken pox	34		24		18	
Diphtheria	13	2	8	1	7	
Dysentery, amebic		1	11	1	15	3
Dysentery, bacillary	2		1			
Leprosy	1		1			1
Malaria	74	4	240	3	438	9
Measles	29	1	30		37	1
Mumps	3		2		1	
Pneumonia		19		13		21
Poliomyelitis	1					
Relapsing fever					1	
Scarlet fever	1		1		1	
Tuberculosis		29		28		43
Typhoid fever	1	1	5		5	2
Whooping cough	11		11		18	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Aug. 25, 1933, pp. 1056–1068. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Sept. 29, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Philippine Islands—Cebu.—During the week ended September 2, 1933, 1 case of cholera with 1 death was reported in Cebu city, Philippine Islands.

Typhus Fever

Syria—Beirut.—During the week ended July 29, 1933, 2 cases of typhus fever were reported in Beirut, Syria.

Yellow Fever

Brazil.—Yellow fever has been reported in parts of Brazil as follows: Ceara State; Lavias, 1 case, 1 death, on June 14, 1933, St. Matheus, 1 case, 1 death, on June 19, 1933; Pernambuco State; Novo Exu, 2 cases, 2 deaths, from June 8–21, 1933, Salgueiro, 1 case 1 death, on June 1, 1933.

French West Africa—Niger Territory—Tahoua.—On August 21, 1933, 2 cases of yellow fever with 2 deaths were reported in Tahoua, Niger Territory, French West Africa.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

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IN THIS ISSUE

Factors of Age, Sex, and Season in Minor Respiratory Attacks
Two Recent Court Decisions on Vital Statistics Records
Deaths in Large Cities During the Week Ended September 2
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of public health.

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PUBLIC HEALTH REPORTS

VOL. 48 SEPTEMBER 22, 1933 NO. 38

INCIDENCE AND CLINICAL SYMPTOMS OF MINOR RESPIRATORY ATTACKS WITH SPECIAL REFERENCE TO VARIATION WITH AGE, SEX, AND SEASON [1]

By SELWYN D. COLLINS, *Senior Statistician*, and MARY GOVER, *Associate Statistician, United States Public Health Service*

Data on minor respiratory illnesses in a group of families of medical officers of the United States Army, Navy, and Public Health Service and the faculty members of certain universities were collected by the Public Health Service under the direction of Surg. J. G. Townsend for a period of 33 months from October 1923 to June 1926, inclusive. These officers were stationed at various places throughout the country, with some representation from nearly every State (2). For a shorter period, reports were received from a group of college students in various universities in the United States.

The method of collecting the data has been described in previous reports (1), (2), (3) but may be briefly summarized: Medical officers who signified their willingness to report respiratory attacks in their families made out an enrollment record for each member of the family, including such essential information as sex, date of birth, and whether the person suffered from any of a group of chronic respiratory diseases that were listed on the form. After enrollment a schedule for reporting attacks of respiratory illness was sent to the officer at semimonthly intervals. The data for the students were collected in the same way, except that each student reported upon himself or herself only. The description of the attack by the reporter included, among other things, the patient's or informant's statement of the diagnosis in terms of the following clinical classes or combinations of those classes:

Cold (includes "cold in head" or "nose cold")
Bronchitis (includes cold in chest with cough)
Sore throat (includes tonsillitis and pharyngitis)
Influenza (includes "grippe" or "flu")
Pneumonia (only if so diagnosed by physician)

Hay fever ("pollen fever" or "rose cold") was also on the schedule but is not included in the total or any subgroup of respiratory diseases in this paper, being reserved for a separate note.

Along with the reported diagnosis was a statement of the symptoms present during the attack, a list of 13 conditions being printed on

[1] From the Office of Statistical Investigations, United States Public Health Service.

the form with a space to check those that appeared at any time during the attack. The present study deals almost entirely with the first four diagnostic groups ordinarily designated as minor respiratory diseases, but the relatively few cases of pneumonia and other serious respiratory conditions are included in the total cases.

The report is based on (*a*) records for a 33-month period for the families of medical officers, and (*b*) records for 1924 for students who reported for all 24 half-months of the calendar year in the seven universities with the largest numbers under observation.

A description of the forms used and an analysis of certain phases of the data have appeared in earlier publications (1), (2), (3). This report considers the frequency of certain symptoms accompanying the attacks (*a*) of the four minor respiratory diagnostic groups (*b*), in different age and sex groups, and (*c*) in different months of the 33-month period. Incidental to this analysis of symptoms, data are presented on age, sex, and chronological variation in the incidence of the different clinical classes of respiratory conditions.

The symptoms which the patient or the informant was asked to check as present or not present during an illness were those that commonly accompany minor respiratory attacks; they are listed in table 1. Some of them were reported rather infrequently, and in certain instances, such as running nose and obstruction of the nostrils, approximately the same physical status is described by both conditions. Data on each of the 13 symptoms, however, have been tabulated.

The frequency with which the various manifestations of the attacks occurred has been expressed as the percentage of cases in which the symptom was checked as present. In considering symptoms, attacks with none of the 13 symptoms checked as present were eliminated as unknown,[2] but in considering case incidence all cases were used.

FREQUENCY AND SYMPTOMS OF CERTAIN CLINICAL DIAGNOSES

The minor respiratory conditions reported were grouped into the four classes enumerated above that might be given the short titles of

[2] Throughout the student observations and in the first 23 months of the family study the number of cases was negligible in which none of the 13 symptoms was checked as present, averaging 6 percent. In September of 1925, after reports from the students had been discontinued, new forms were adopted in which the persons under observation and the occurrence of cases were reported on one sheet and the symptoms on another. Many of these symptom reports were never received for cases whose occurrence was reported. In the last 10 months of the study, when this plan was used, 34 percent of the cases are unknown as to symptoms present. The unknowns were eliminated from the symptom tabulations throughout the study, both before and after the change in forms. Even with this procedure there are evidences of some incompleteness in symptom reports. All cases reported under the diagnosis of sore throat should obviously have had sore throat checked as a symptom; but even when illnesses with unknown symptoms are subtracted from the total, the percentage of cases of sore throat that had "sore throat" checked as a symptom is only 87 in the families and about the same in the student group. Similarly, "cough" was not always checked in cases reported as bronchitis nor "running nose" in cases of coryza or head cold. On the whole, however, the report of symptoms seems reasonably complete.

coryza, bronchitis, sore throat, and influenza. However, many attacks were reported as including two or more of these diagnoses, such as coryza and bronchitis, bronchitis and sore throat, etc. To classify cases with two or more diagnoses into the four classes it would be necessary to set up some arbitrary rules for their allocation; for the present report on symptoms it seemed more desirable to deal with cases reported under a single diagnosis, and, accordingly, illnesses with two or more diagnoses were put in a separate class. An exception was made for influenza and pneumonia reports, the case being so classified regardless of accompanying diagnoses. Hay fever was eliminated from the total and from all classes of respiratory cases considered in this study.

The reported diagnoses might have been further corrected or refined according to the symptoms checked as present in the attack. For example, many cases reported simply as cold in the head had sore throat indicated as a symptom and might well have been put in the class of coryza and sore throat instead of coryza only. For this paper, however, the reporter's diagnosis was accepted as final for two reasons: (*a*) In the families the informants were nearly all physicians, and (*b*) it was desired to examine the nature of minor respiratory attacks commonly designated by these four names.

In the families of medical officers during the 33-month period ending June 30, 1926, there was an average annual incidence of 1,851 respiratory cases per 1,000 persons under observation, or nearly 2 attacks per person per year. Of this total, about half (918 per 1,000) were reported as coryza or head colds. Nearly one-fourth (447 per 1,000) were combinations of two or more diagnoses.[3] The other one fourth of the cases were reported as influenza (235 per 1,000), sore throat (136 per 1,000) and bronchitis (115 per 1,000).

The annual incidence of respiratory attacks among the students was 80 percent higher than in the family group, being 3,333 per 1,000, or more than three colds per person per year. While these rates are not for the same time period, there is reason to believe that the difference is due largely to the circumstances that the students reported upon themselves only and remembered more trivial attacks than did

[3] Of this "all other" class of attacks, there were the following:

	Number of cases	Annual rate per 1,000	Percent of cases
Total for this class	3,683	446.7	100.0
Coryza and bronchitis	1,673	202.9	45.4
Coryza and sore throat	1,212	147.0	32.9
Coryza and bronchitis and sore throat	465	56.4	12.6
Bronchitis and sore throat	140	17.0	3.8
Sinusitis alone or with other diagnoses	123	14.9	3.4
Pneumonia (all forms)	51	6.2	1.4
All other	19	2.3	.5

the household head who reported upon the whole family. Also the students used in this paper were exceptionally conscientious reporters, for they include only those who submitted a record for every half month in 1924 whether in school or on vacation.

The student rate of 3,333 respiratory cases per 1,000 approximates closely rates found for 3 consecutive years (3,340, 3,200, and 2,980 per 1,000) by Doull, Herman, and Gafafer (4) for Johns Hopkins medical students. The respiratory rate for 2 consecutive years (3,175, 3,072 per 1,000) found by Van Volkenburgh and Frost (5) for a group of Baltimore families kept under close observation approximates the student rate in this study (3,333 per 1,000) much more closely than the family rate (1,851 per 1,000).[4]

More of the students' illnesses were reported simply as coryza or head colds than in the case of the medical officers' families—2,389 per 1,000, or 72 percent of the total respiratory cases. About 15 percent of the attacks (507 per 1,000) were combinations of the several diagnoses, and the remaining 13 percent consisted of sore throat (180 per 1,000), bronchitis (141 per 1,000), and influenza (116 per 1,000).

TABLE 1.—*Frequency of certain symptoms in specific respiratory conditions*

Symptoms	Percent of cases with the specified symptom									
	Medical officers' families, October 1923–June 1926					Students, calendar year 1924				
	All respiratory	Coryza [a]	Bronchitis [a]	Sore throat [a]	Influenza [a]	All respiratory	Coryza [a]	Bronchitis [a]	Sore throat [a]	Influenza
	Both sexes									
Fever	32	16	38	45	88	16	10	17	29	75
Aching in body	27	16	18	29	71	21	15	25	25	77
Headache	29	21	19	34	60	36	33	30	32	66
Chill or chilliness	11	6	11	13	31	19	16	19	18	59
Constipation	15	11	16	17	26	19	17	14	18	41
Sudden onset	46	42	43	49	61	46	46	40	42	55
Cough	52	35	97	31	66	40	31	90	23	45
Tightness in chest	17	6	44	7	34	14	7	56	5	26
Expectoration	25	14	47	16	34	36	31	44	26	39
Sore throat	32	16	14	87	41	38	26	28	86	54
Running nose	74	87	37	19	59	75	82	33	15	57
Obstruction of nostrils	47	51	21	14	43	55	57	29	15	46
Inflammation of eyes	15	15	9	6	23	16	15	10	9	29
Total cases [b]	13,182	6,525	817	985	1,712	6,306	4,478	268	347	228

[a] Cases in which two or more respiratory diagnoses were reported are included in the total but are excluded from the specific classes, except that influenza with any other minor respiratory diagnosis was classified as influenza.

[b] Respiratory cases with none of the 13 symptoms checked as present were considered unknown for symptoms and excluded from symptom tabulations but included in incidence tabulations. For students this table includes a few cases under 16 and a few over 34 years of age that are not included in tables 3 and 4.

[4] The figure for families of 1,851 per 1,000 is an *annual* rate based on 33 months' experience. The 3 missing months out of a full 3-year period are July, August, and September, the months of low incidence, and so an adjustment for this fact would make the rate even less than it is. Cases with unknown week of onset are included throughout this paper but were excluded in the preceding paper on weekly incidence (3).

TABLE 1.—*Frequency of certain symptoms in specific respiratory conditions*—Con.

Symptoms	Percent of cases with the specified symptom									
	Medical officers' families, October 1923-June 1926					Students, calendar year 1924				
	All respiratory	Coryza [a]	Bronchitis [a]	Sore throat	Influenza [a]	All respiratory	Coryza [a]	Bronchitis [a]	Sore throat [a]	Influenza [a]
	Male									
Fever	32	15	40	46	82	17	10	17	31	76
Aching in body	25	15	16	25	70	20	14	24	23	76
Headache	27	20	17	30	55	34	30	25	33	66
Chill or chilliness	10	5	9	11	30	18	15	21	18	61
Constipation	15	11	13	19	26	22	19	16	20	46
Sudden onset	45	40	42	50	61	46	47	39	41	55
Cough	53	36	97	31	68	41	32	91	23	45
Tightness in chest	18	6	45	6	35	14	7	56	3	29
Expectoration	29	17	51	21	38	42	37	54	30	46
Sore throat	30	16	14	86	40	37	25	28	95	58
Running nose	74	86	36	21	59	75	80	37	17	55
Obstruction of nostrils	49	51	22	17	46	61	63	34	18	49
Inflammation of eyes	15	14	8	7	24	16	14	11	9	28
Total cases [b]	6,856	3,326	444	495	879	4,176	2,920	169	207	173
	Female									
Fever	32	16	37	43	80	16	10	17	25	73
Aching in body	29	18	19	33	72	23	18	28	29	78
Headache	32	23	20	38	66	41	39	37	31	65
Chill or chilliness	12	6	12	15	32	22	19	16	19	55
Constipation	15	11	19	14	27	14	12	10	14	27
Sudden onset	47	43	43	47	60	44	46	40	43	55
Cough	50	35	96	30	64	39	31	88	24	45
Tightness in chest	17	6	44	7	34	13	7	55	6	18
Expectoration	20	10	42	11	29	23	19	27	21	16
Sore throat	33	17	14	88	42	38	29	29	74	42
Running nose	73	87	37	17	58	76	84	26	13	60
Obstruction of nostrils	44	49	21	11	39	44	43	21	11	36
Inflammation of eyes	15	15	9	5	22	18	18	9	9	33
Total cases [b]	6,326	3,199	373	490	833	2,130	1,558	99	140	55

See footnotes [a] and [b], p. 1158

The record of the symptoms present in each attack makes possible a comparison of the general characteristics of cases that were reported in the four diagnostic groups. Table 1 contains data for the families of medical officers and for students. Figure 1 gives a general outline of the symptoms accompanying each diagnosis. The pictures for the student and the family groups are very similar; but since each student is reporting upon himself only, the data are presumably more accurate for that group, particularly for symptoms of a subjective nature. As might be expected, the outstanding symptom in attacks reported simply as coryza or head cold is a running nose, and in attacks reported as bronchitis and as sore throat the distinctive symptoms are cough and sore throat, respectively. In each of these diagnoses the other symptoms do not occur in a large proportion of the cases. The situation with respect to influenza is quite different. The outstanding symptoms in this category might be said to be fever.

aching in the body, and headache, but in addition the other symptoms are more frequently present in influenza than in other respiratory attacks.

It is a matter of interest to know whether certain symptoms occur with any greater frequency among men than among women during respiratory attacks. Many of the symptoms are of a subjective character and the best comparison is probably between men and women students, because each person reported on his or her own case

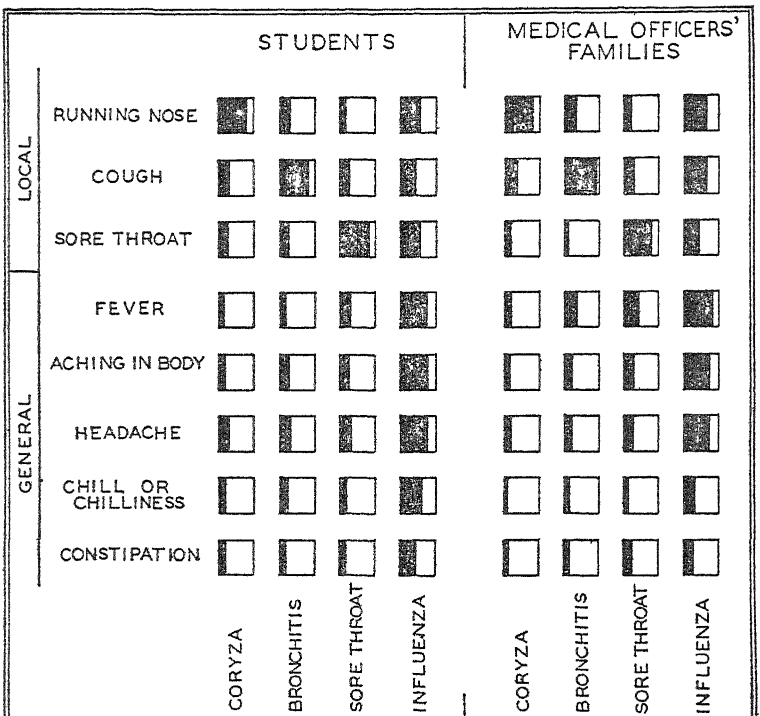

FIGURE 1—Frequency of certain symptoms accompanying attacks of specific respiratory conditions, medical officers' families 1923-28, and students 1924 (Black=symptom reported as present, white=symptom not reported as present)

only. In figure 2 this comparison is made. The great majority of the symptoms occur with about equal frequency in the two sexes, but the proportion of attacks having constipation, obstruction of the nostrils, and expectoration is greater among males than among females for each of the four diagnoses.

FREQUENCY AND SYMPTOMS OF ATTACKS AT DIFFERENT AGES

The age incidence of the various respiratory conditions should be considered preliminary to a study of the variation with age in the symptoms of such attacks. Table 2 and figure 3 show the age and

sex incidence of all respiratory attacks and of each of the several reported diagnoses. It does not seem necessary to go into any de-

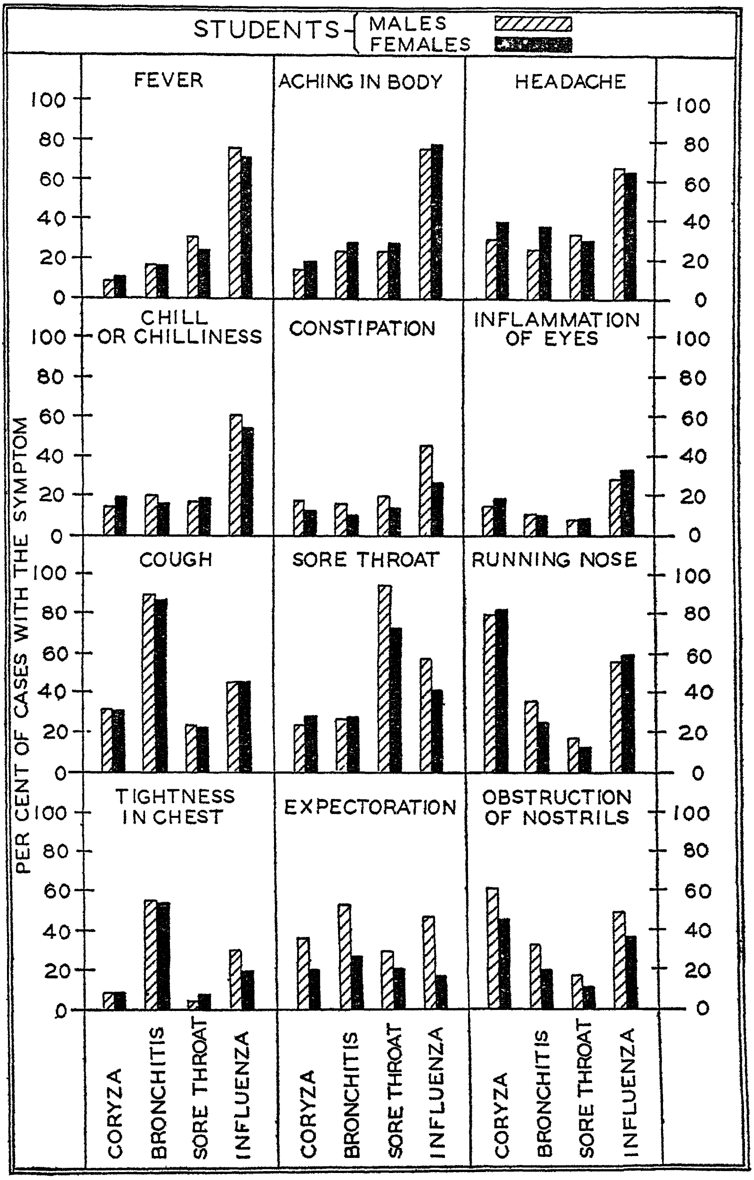

FIGURE 2.—Frequency of certain symptoms accompanying attacks of specific respiratory conditions among male and female students in seven colleges and universities, 1924.

tailed discussion of the nature of these curves. It should be noted, however, that there are rather marked differences between the various diagnoses. The influenza and bronchitis curves are unlike, and

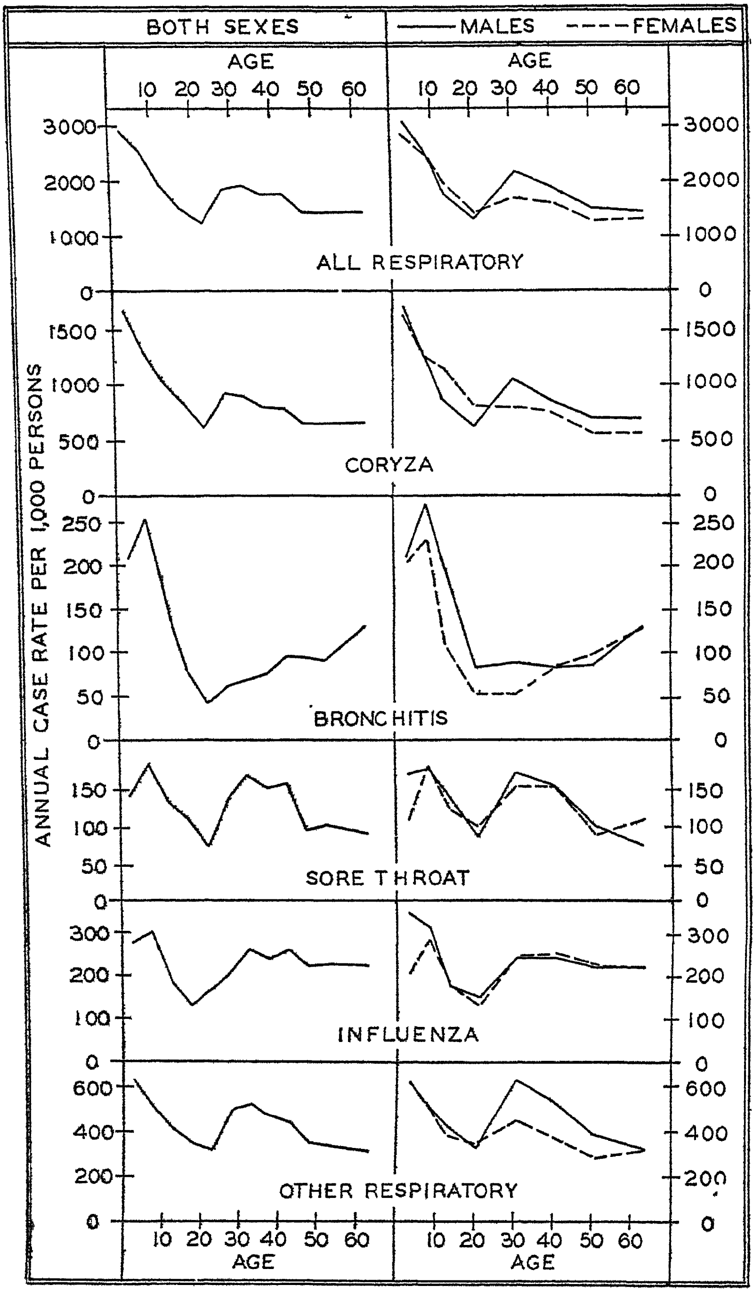

FIGURE 3.—Age and sex incidence of specific respiratory conditions among medical officers' families, 1923–[illegible]. (Vertical scales arranged so that the rate for all ages of both sexes plots at same height from base line on each chart. "Other respiratory" is composed almost entirely of cases with two or more diagnoses.)

both are different from the curve for coryza. The age curve of sore throat resembles that of influenza in some respects, but is unlike either coryza or bronchitis.

There is one source of error in the sex incidence of these diseases. The reporter for each family was the male head of the household and the sharp rise in the rate for all respiratory attacks at the beginning of the adult ages suggests that the informant remembered his own minor illnesses better than those of the rest of the household. This assumption is strengthened by the fact that the rise is largely accounted for by coryza and the group of two or more diagnoses that is

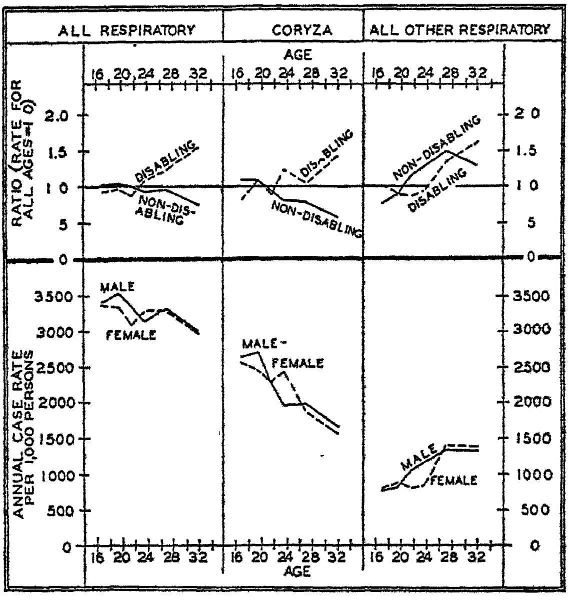

FIGURE 4.—Relative age incidence of disabling and of non-disabling respiratory cases among all students (top), and actual age incidence of all respiratory cases among male and female students (bottom), seven colleges and universities for the year 1924.

dominated by coryza. From about 25 years until the end of life the respiratory rate for males is consistently above that for females. The data for male and female students (fig. 4) indicates little or no difference between the sexes in the frequency of attacks. Van Volkenburgh and Frost (5) found higher rates for adult females than for males, but the wife was usually the reporter. Also, in the majority of other studies, including those of industrial employees where the reporting factor is eliminated, the respiratory rate seems to be higher among women than among men (6) (7).

TABLE 2.—*Age and sex incidence of specific respiratory conditions among medical officers' families during the 33-month period, October 1923–June 1926*

Age	Annual case rate per 1,000: All respiratory	Coryza [1]	Bronchitis [1]	Sore throat [1]	Influenza [1]	All other respiratory [2]	Average number of persons under observation [3]
	Both sexes						
All ages	1,851	918	115	130	235	447	2,998
0 to 4	2,859	1,653	204	138	274	620	308
5 to 9	2,494	1,261	248	179	301	505	280
10 to 14	1,859	998	147	132	183	399	265
15 to 19	1,449	795	75	108	129	342	135
20 to 24	1,196	601	39	72	165	319	66
25 to 29	1,799	908	58	138	202	493	169
30 to 34	1,898	881	66	169	261	521	403
35 to 39	1,710	793	71	149	236	461	363
40 to 44	1,710	766	93	156	256	439	342
45 to 49	1,384	636	91	92	218	347	252
50 to 54	1,376	627	88	99	223	339	199
55 and over	1,379	628	128	89	219	315	216
	Male						
All ages	1,934	944	127	138	241	484	1,494
0 to 4	3,030	1,690	207	169	345	619	153
5 to 9	2,530	1,270	267	177	311	505	146
10 to 14	1,768	842	187	140	179	420	130
15 to 24	1,271	627	79	88	150	327	87
25 to 34	2,178	1,054	86	171	242	625	215
35 to 44	1,834	832	81	154	240	527	362
45 to 54	1,466	685	85	98	217	381	282
55 and over	1,427	684	128	73	220	322	119
	Female						
All ages	1,769	892	104	134	229	410	1,504
0 to 4	2,750	1,616	202	108	204	620	155
5 to 9	2,453	1,251	228	182	290	502	134
10 to 14	1,947	1,147	108	124	186	382	135
15 to 24	1,439	810	51	102	134	342	114
25 to 34	1,682	789	50	153	244	446	357
35 to 44	1,579	725	82	152	252	368	343
45 to 54	1,237	544	97	90	226	280	169
55 and over	1,320	559	127	109	217	308	97

[1] Refers to cases with sole diagnosis only, except that influenza with any other minor respiratory diagnosis was classified as influenza.
[2] Composed almost entirely of cases with two or more diagnoses (see footnote 3, p. 1157 for details).
[3] After the first 4 months, when enrollment was completed, the number under observation varied relatively little from month to month. See table 7 for the average number for each month.

Data for the student group for the college ages are shown in tables 3 and 4 and figure 4. The rate for coryza in the family data distinctly declines as age increases, particularly for females who were not the reporters at any age. In the upper section of figure 4 rates for students are shown separately for disabling and nondisabling cases, the latter consisting of the attacks that did not keep the student from attending classes. The decline with age is all accounted for by the nondisabling cases; the incidence of disabling cases tends to increase with age. For respiratory conditions other than coryza, the incidence of both the disabling and nondisabling increase with age.

TABLE 3.—*Age incidence of respiratory affections among male and female college*[1] *students during the calendar year 1924*

Age	Annual case rate per 1,000						Number of students under observation	
	All respiratory		Coryza[2]		All other respiratory			
	Male	Female	Male	Female	Male	Female	Male	Female
All ages	3,356	3,289	2,377	2,412	979	877	1,229	643
16 to 18	3,401	3,351	2,627	2,546	773	804	357	271
19 to 20	3,518	3,327	2,702	2,449	816	879	299	214
21 to 22	3,324	3,078	2,271	2,273	1,052	805	210	77
23 to 24	3,133	3,267	1,958	2,433	1,175	833	143	30
25 to 29	3,313	3,267	1,976	1,867	1,337	1,400	166	30
30 to 34	3,000	2,952	1,667	1,571	1,333	1,381	54	21

[1] Colleges included and the numbers of students 16 to 34 years of age of each sex observed were: Harvard University, Boston (M, 218); Ohio State University, Columbus (M, 281; F, 245); Chicago University, Chicago (M, 165; F, 52); Johns Hopkins University, Baltimore (M, 156; F, 17); Georgetown University and employees of the Public Health Service, Washington (M, 112; F, 18); Tulane University, New Orleans (M, 151; F, 51); California University, Berkeley (M, 146; F, 260).
[2] Refers to cases reported with the sole diagnosis of cold in head.

TABLE 4.—*Age incidence of disabling*[1] *and nondisabling respiratory affections among college*[2] *students during the calendar year 1924*

Age	Annual case rate per 1,000									Number of students under observation
	All respiratory			Coryza[3]			All other respiratory			
	All cases[4]	Nondisabling	Disabling	All cases[4]	Nondisabling	Disabling	All cases[4]	Nondisabling	Disabling	
All ages	3,333	2,607	499	2,389	1,997	202	944	611	296	1,872
16 to 18	3,379	2,662	462	2,592	2,201	167	787	461	295	628
19 to 20	3,439	2,749	485	2,596	2,199	222	843	550	263	513
21 to 22	3,258	2,588	436	2,272	1,892	181	986	697	254	287
23 to 24	3,156	2,416	532	2,040	1,642	254	1,116	775	277	173
25 to 29	3,306	2,500	612	1,959	1,592	214	1,347	908	398	196
30 to 34	2,987	1,960	773	1,640	1,174	293	1,347	787	480	75

[1] Causing student to lose time from classes.
[2] See footnote to table 3 for colleges included.
[3] Refers to cases reported with the sole diagnosis of cold in head.
[4] "All cases" includes some that were unknown as to disability.

As already noted, the data on symptoms are set up as the percentage of attacks having the condition rather than in the form of incidence rates for cases having given symptoms. Table 5 and figure 5 show for specific age and sex groups the proportion of all respiratory attacks that had certain symptoms. In this connection it should be recalled that the men were the reporters, and so the cases for females were for all ages reported by the males, and the age curves would be less subject to distortion on account of the reporting factor.

TABLE 5.—*Frequency of certain symptoms in all respiratory affections at different ages among members of medical officers' families, October 1923–June 1926*

Age	Total cases with known symptoms [1]	Percent of cases with the specified symptom												
		Fever	Aching in body	Headache	Chill or chilliness	Constipation	Sudden onset	Cough	Tightness in chest	Expectoration	Sore throat	Running nose	Obstruction of nostrils	Inflammation of eyes
	Both sexes													
All ages	13, 182	32	27	29	11	15	46	52	17	25	32	74	47	15
0 to 4	2, 128	36	7	7	4	15	43	59	11	10	15	83	43	18
5 to 9	1, 675	39	16	19	6	15	44	64	14	16	24	70	41	12
10 to 14	1, 118	33	18	27	8	11	42	50	14	17	29	74	46	12
15 to 24	626	32	31	33	12	11	51	47	15	24	33	75	48	15
25 to 34	2, 661	27	35	41	13	18	46	44	18	29	42	73	50	18
35 to 44	2, 900	30	36	38	13	14	48	47	21	31	38	72	51	14
45 to 54	1, 391	31	38	37	15	15	51	53	23	37	34	72	49	13
55 and over	683	27	34	29	14	15	50	54	24	37	31	68	41	14
	Male													
All ages	6, 856	32	25	27	10	15	45	53	18	29	30	74	49	15
0 to 4	1, 091	39	7	8	4	14	40	59	12	9	17	83	44	18
5 to 9	892	39	17	19	6	15	45	64	15	16	21	71	40	14
10 to 14	521	37	18	27	6	11	41	55	18	25	28	71	48	15
15 to 24	249	38	33	31	13	15	47	53	18	29	29	75	50	10
25 to 34	1, 181	25	32	36	11	18	45	45	17	36	41	73	52	17
35 to 44	1, 607	28	33	34	13	14	47	48	20	36	38	73	55	14
45 to 54	925	29	35	32	13	15	52	54	22	42	33	74	51	13
55 and over	390	24	30	23	13	15	47	56	22	41	25	71	43	13
	Female													
All ages	6, 326	32	29	32	12	15	47	50	17	20	33	73	44	15
0 to 4	1, 037	34	7	7	5	16	45	59	11	10	14	84	41	18
5 to 9	783	39	15	19	7	15	43	63	13	16	27	69	42	10
10 to 14	597	30	18	27	9	11	43	47	10	11	29	76	45	10
15 to 24	377	27	30	35	11	9	53	44	13	20	35	75	47	18
25 to 34	1, 480	29	38	44	15	17	47	43	19	22	42	73	48	18
35 to 44	1, 293	31	39	44	14	14	49	46	21	26	39	70	46	15
45 to 54	466	35	44	47	18	16	50	50	25	26	36	68	43	13
55 and over	293	31	39	36	15	15	53	52	26	33	38	64	38	16

[1] Respiratory cases with none of the 13 symptoms checked as present were considered unknown for symptoms and excluded from symptom tabulations but included in incidence tabulations.

A few of the important variations with age and sex might be pointed out. Aching in body or limbs and headache are reported rather infrequently among children. This would obviously be true in the early ages because of the child's inability to describe his pains even though a high proportion of cases had these aches. However, the rise continues to about 30 years, or far beyond the age when there would be any difficulty in obtaining a statement of symptoms. The age curves of aching and headache are alike in other respects also and are quite different from the curve for fever, which tends to occur more frequently in children than in other ages. As fever is an objective symptom, presumably obtained in the majority of cases by

the use of a thermometer, the higher frequency in childhood appears to be real.

The proportion of cases reporting a cough is somewhat similar in age and sex variation to the incidence of bronchitis (fig. 3), being high in young children, dropping to a minimum in early adult ages, and increasing after that age. Expectoration is rarely reported

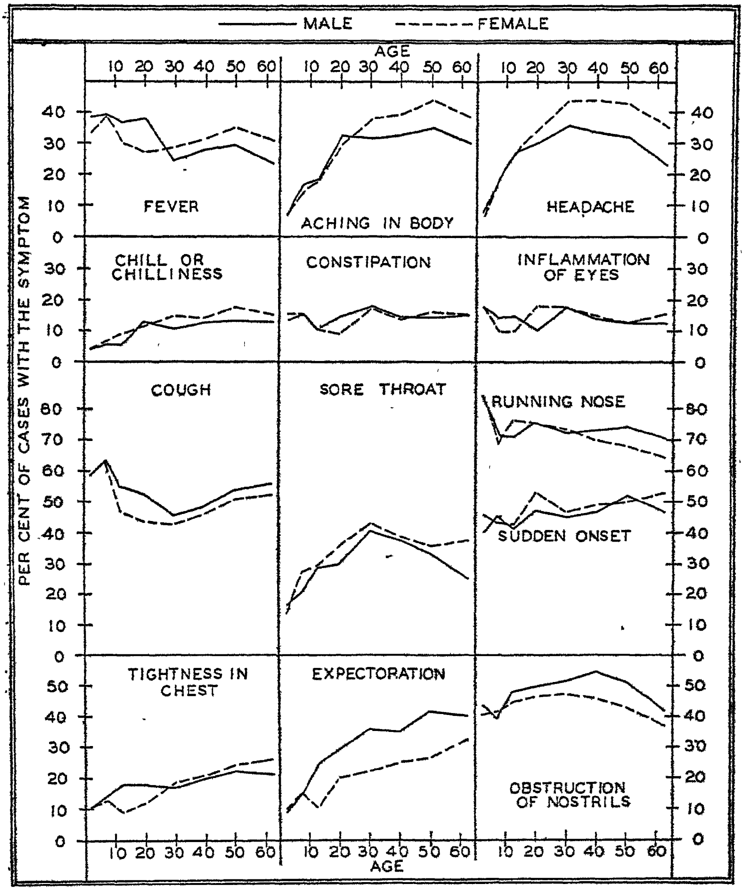

FIGURE 5.—Frequency of certain symptoms accompanying respiratory attacks in different age-sex groups, medical officers' families, 1923-26.

among children. Expectoration and tightness in the chest increase with age throughout life.

Running nose is a frequent symptom of respiratory attacks at every age, but is more frequent in childhood, tending to decline as age increases. Obstruction of the nostrils, on the other hand, is less common in attacks of children than at older ages, the frequency of the

symptom increasing up to 30 or 40 years and again declining in the older ages.

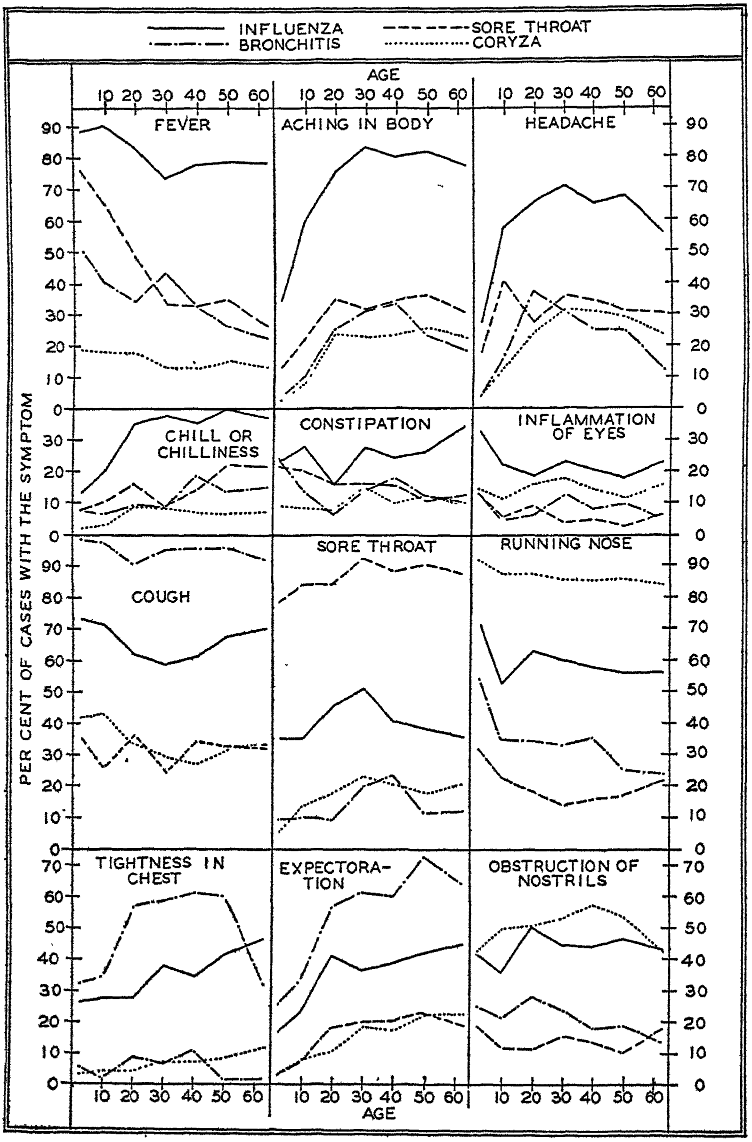

FIGURE 6.—Frequency of certain symptoms accompanying attacks of specific respiratory conditions at different ages, medical officers' families, 1923–26.

With respect to the sexes, respiratory attacks among adult women are reported as more frequently accompanied by headache, aching in body, fever, chilliness, and tightness in the chest than attacks among adult men. Sore throat is slightly higher among females almost

throughout life. On the other hand, at practically all ages expectoration, obstruction of the nostrils, and cough are more frequent among males. The other symptoms show no consistent differences between the sexes.

The designation given to the respiratory case by the patient or informant may frequently have been a choice of words rather than a real indication of the nature of the attack. However, the symptoms reported for the different diagnoses are *on the average* quite different (figs. 1 and 2), even though some cases in one class had symptoms very similar to those of another diagnostic class. It is possible that some of the age variation in the symptoms reported may be due to varying proportions of the different diagnoses that make up the total respiratory cases at the different ages. Apart from this fact, the age curves of the symptoms of specific reported diagnoses are of interest. The data are shown in table 6 and figure 6.

In considering the curves in figure 6 in comparison with symptom curves shown in figure 5, it must be remembered that nearly one fourth of the cases included in the "all respiratory" group are excluded from all four specific classes because they were reported as combinations of two or more diagnoses.

In general, the characteristics of the age curves of symptoms noted in connection with figure 5 for all respiratory conditions are true for each of the specific diagnoses. The important symptom of fever is high in childhood for each diagnosis, but the decline as age increases is particularly rapid in cases designated as sore throat. The cases reported as influenza stand out as having at every age definitely more of the general symptoms such as fever, aching in body, headache, chilliness, and constipation. Even cough, tightness in the chest, expectoration, sore throat, running nose, obstruction of the nostrils, and inflammation of the eyes occur more frequently at each age in influenza than in the other diagnoses except the ones in which the local symptom is one of the major manifestations of the attack, viz, nose symptoms with coryza, chest symptoms with bronchitis, and sore throat with cases of sore throat.

FREQUENCY AND SYMPTOMS OF ATTACKS IN DIFFERENT MONTHS

Considering in monthly intervals the incidence of the several reported diagnoses as shown in table 7 and at the top of figure 7, it may be seen that coryza is highest in the fall of the year and decreases throughout the winter and spring[5]. Influenza, on the other hand, increases to a maximum in the late winter and early spring months. Bronchitis falls between these two extremes, with a rather definite

[5] Considered in weekly intervals, respiratory disease incidence presents a series of epidemic-like peaks (apparently not chance variation) that come at such frequent intervals that they are largely averaged out in monthly data (3).

TABLE 6.—*Frequency of certain symptoms in specific respiratory conditions at different ages among members of medical officers' families, October 1923 to June 1926*

Age	Total cases with known symptoms [1]	Percent of cases with the specified symptom												
		Fever	Aching in body	Headache	Chill or chilliness	Constipation	Sudden onset	Cough	Tightness in chest	Expectoration	Sore throat	Running nose	Obstruction of nostrils	Inflammation of eyes
	Coryza [2]													
All ages	6,525	16	16	21	6	11	42	35	6	14	16	87	51	15
0 to 4	1,220	19	3	3	2	10	38	42	3	4	6	91	42	15
5 to 14	1,416	18	8	12	3	9	37	43	4	8	14	87	49	12
15 to 24	330	18	24	24	9	8	47	34	5	11	18	87	50	16
25 to 34	1,273	13	23	32	9	15	41	30	8	18	23	85	53	18
35 to 44	1,330	13	24	31	7	10	41	27	7	18	21	85	57	15
45 to 54	633	15	25	29	7	13	46	31	9	23	18	86	54	12
55 and over	323	13	23	24	7	9	49	34	12	23	21	84	42	16
	Bronchitis [2]													
All ages	817	38	18	19	11	16	43	97	44	47	14	37	21	9
0 to 4	154	51	4	4	8	24	44	99	33	26	10	54	25	14
5 to 14	260	40	10	17	7	14	39	98	35	34	10	35	22	5
15 to 24	32	34	25	38	9	6	31	91	56	56	9	34	28	6
25 to 34	87	44	31	31	9	14	47	95	59	61	20	33	24	13
35 to 44	138	33	33	25	19	18	45	96	61	59	24	36	17	9
45 to 54	80	26	24	25	14	13	44	93	60	73	11	25	19	10
55 and over	66	23	18	12	15	11	46	92	32	64	12	24	14	5
	Sore throat [2]													
All ages	985	45	29	34	13	17	49	31	7	16	87	19	14	6
0 to 4	101	76	13	18	8	22	55	36	6	4	78	32	19	13
5 to 14	201	65	22	41	10	20	61	26	3	8	84	22	12	6
15 to 24	43	49	35	28	16	16	42	37	9	19	84	19	12	9
25 to 34	239	33	31	36	9	16	42	25	7	20	92	14	16	4
35 to 44	255	33	34	35	14	15	45	35	11	20	88	16	14	5
45 to 54	100	35	36	31	22	11	50	33	2	23	90	17	10	3
55 and over	46	26	30	30	22	13	35	33	2	20	87	22	17	7
	Influenza [2]													
All ages	1,712	88	71	60	31	26	61	66	34	34	41	59	43	23
0 to 4	208	89	34	27	14	24	57	74	26	17	35	71	41	34
5 to 14	329	90	59	57	20	28	61	72	27	23	35	53	36	23
15 to 24	68	84	75	66	35	16	74	63	28	41	46	63	50	19
25 to 34	348	73	83	71	38	28	56	59	38	36	51	60	45	23
35 to 44	425	78	80	66	36	25	61	61	35	39	41	58	44	21
45 to 54	227	79	82	68	40	27	65	68	41	42	38	56	46	18
55 and over	107	79	78	56	37	35	61	70	47	45	36	56	43	23

[1] Respiratory cases with none of the 13 symptoms checked as present were considered unknown for symptoms and excluded from symptom tabulations but included in incidence tabulations.
[2] Refers to cases with sole diagnosis only, except that influenza with any other minor respiratory diagnosis was classified as influenza.

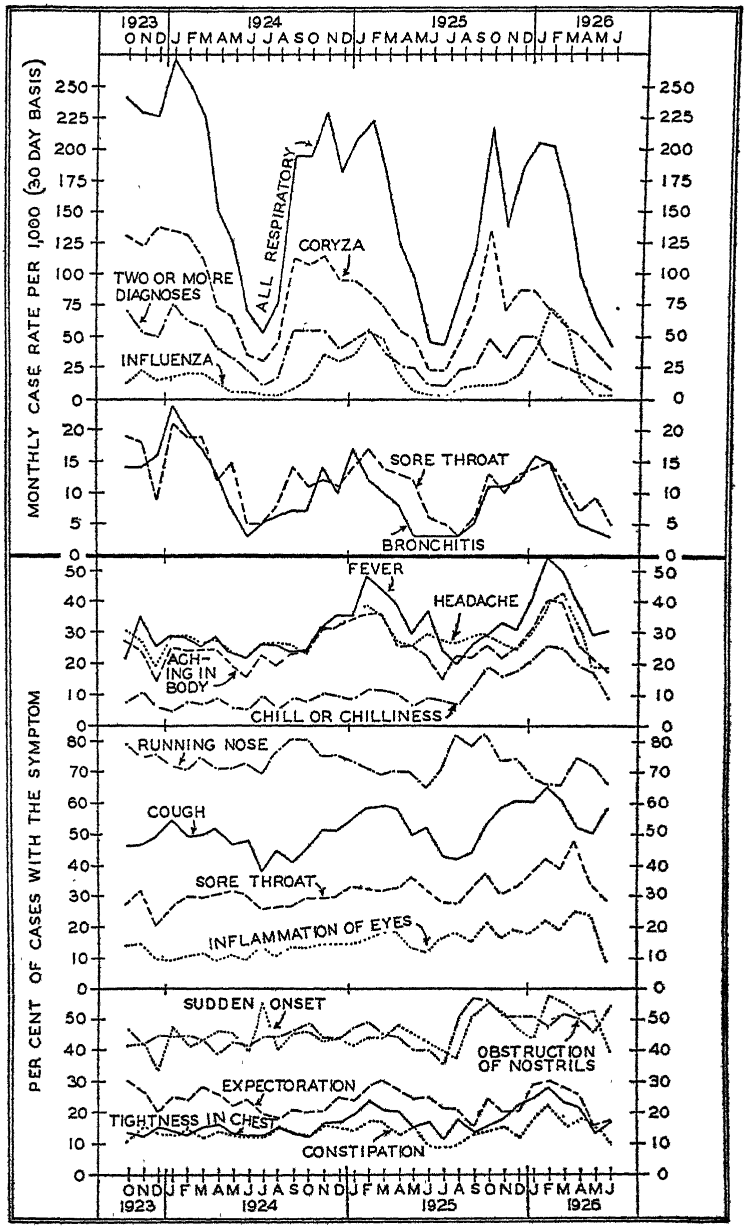

FIGURE 7.—Frequency of certain symptoms accompanying all respiratory attacks in different months (bottom), and monthly incidence of specific respiratory diagnoses (top); medical officers' families, 1923-26.

peak in January in each of the 3 years. Sore throat shows a rather regular seasonal variation in which all the winter months have high rates but no one stands out in a sharp or definite peak. The summer is the minimum in the incidence of all the diagnoses, July usually having the lowest rate.

TABLE 7.—*Monthly incidence of specific respiratory conditions in medical officers' families and monthly mortality from influenza and pneumonia in the general population (death registration area) of the United States, October 1923 to June 1926*

Month	Medical officers' families							General population	
	Monthly case rate per 1,000 (30-day basis)						Average number of persons under observation	Monthly death rate per 100,000 (30-day basis)	
	All respiratory	Coryza[1]	Bronchitis[1]	Sore throat[1]	Influenza[1]	All other respiratory[2]		Influenza	Influenza and pneumonia
1923									
October	243	131	14	19	12	67	768	0.65	5.9
November	230	122	14	18	23	53	938	1.15	9.0
December	228	138	16	9	14	51	1,171	1.46	10.6
1924									
January	272	134	24	21	18	75	2,114	2.37	14.7
February	252	130	20	19	21	62	3,060	3.04	16.3
March	227	113	17	19	21	57	3,243	3.22	16.6
April	149	72	13	12	13	39	3,591	2.60	14.3
May	125	65	7	15	6	32	3,701	1.40	9.1
June	69	34	3	5	5	22	3,740	.74	6.0
July	52	29	5	5	2	11	3,759	.36	3.3
August	77	44	6	8	2	17	3,796	.31	3.0
September	194	112	7	14	7	54	3,841	.43	4.0
October	195	107	7	11	16	54	3,874	.75	6.2
November	230	116	14	12	34	54	3,898	1.40	9.1
December	183	94	10	11	29	39	3,914	2.47	12.6
1925									
January	207	94	17	14	35	47	3,419	3.39	15.5
February	222	84	12	17	53	56	2,961	4.63	17.5
March	181	73	10	14	47	37	2,971	6.04	18.8
April	122	54	8	13	20	27	2,981	5.26	15.7
May	94	48	3	12	5	26	2,989	2.41	9.4
June	45	22	3	6	3	11	3,000	1.03	5.3
July	43	23	3	5	1	11	3,006	.49	3.4
August	81	45	3	3	8	22	3,024	.57	3.6
September	120	74	5	6	10	25	3,054	.67	4.1
October	217	134	11	13	11	48	3,101	1.12	6.7
November	137	71	11	10	13	32	3,126	1.62	10.0
December	182	88	12	13	19	50	3,147	2.19	12.3
1926									
January	206	86	16	14	41	49	3,108	4.06	17.4
February	203	70	15	15	72	31	3,037	5.83	18.9
March	163	58	9	11	59	26	3,037	11.08	28.2
April	97	49	5	7	15	21	3,037	8.35	21.2
May	66	35	4	9	2	16	3,037	2.94	10.8
June	42	23	3	5	3	8	3,037	1.15	6.0

[1] Refers to cases with sole diagnosis only, except that influenza with any other minor respiratory diagnosis was classified as influenza.
[2] Composed almost entirely of cases with two or more diagnoses (see footnote 3, p. 1157 for details).

These differences in the seasonal variation of the several reported diagnoses may indicate merely that the prevailing type of cold and the part or parts of the respiratory tract affected vary with season. They are, nevertheless, of interest along with the age incidence

and symptoms of respiratory attacks commonly classified in these categories.

TABLE 8.—*Frequency of certain symptoms in all respiratory affections in different months among members of medical officers' families, October 1923–June 1926*

Month	Total cases with known symptoms [1]	Percent of cases with the specified symptom												
		Fever	Aching in body	Headache	Chill or chilliness	Constipation	Sudden onset	Cough	Tightness in chest	Expectoration	Sore throat	Running nose	Obstruction of nostrils	Inflammation of eyes
1923														
October	192	21	27	31	7	11	42	46	14	30	28	79	47	15
November	205	35	25	28	11	16	43	47	13	27	32	75	42	14
December	255	25	15	20	6	13	34	49	16	20	21	76	45	9
1924														
January	574	29	25	29	4	13	48	54	14	26	27	72	45	9
February	707	28	24	29	7	15	42	49	14	24	30	71	46	11
March	733	25	24	27	6	12	44	50	16	29	30	75	44	12
April	514	28	24	27	8	14	47	52	17	26	30	72	39	9
May	455	24	19	24	5	13	46	47	14	23	32	71	44	12
June	241	22	15	22	5	12	40	48	13	25	30	73	42	9
July	192	26	23	26	10	12	56	38	13	20	26	69	44	14
August	285	25	19	26	5	15	41	45	15	19	27	77	45	11
September	702	23	23	26	8	13	46	41	13	21	27	80	47	14
October	745	24	24	24	8	13	47	45	12	21	29	80	49	14
November	850	31	30	32	10	16	44	51	17	21	29	75	44	15
December	698	35	32	32	9	16	44	51	17	25	30	75	44	15
1925														
January	678	35	34	35	8	15	42	55	19	24	33	74	48	15
February	578	48	36	39	12	17	45	59	24	29	32	71	49	16
March	537	44	36	35	11	17	45	59	21	31	32	70	45	18
April	343	38	25	27	10	13	49	58	21	28	32	70	45	18
May	270	29	25	26	6	16	46	49	15	24	36	70	40	13
June	123	37	22	29	9	10	43	52	17	25	33	65	41	12
July	119	24	15	27	8	9	40	43	12	22	29	71	36	17
August	240	19	23	27	7	11	38	42	18	22	28	82	51	18
September	287	25	21	28	12	14	52	44	14	16	32	79	57	15
October	436	29	26	29	19	15	57	53	16	25	37	83	56	22
November	255	33	22	27	16	17	53	59	18	21	31	74	51	16
December	361	31	25	25	17	12	48	61	23	21	34	74	52	19
1926														
January	405	42	31	31	22	19	45	61	25	29	38	68	52	18
February	410	54	40	40	26	23	58	66	29	31	42	66	48	22
March	391	49	40	43	25	16	56	61	24	28	39	66	52	20
April	210	33	27	32	20	19	53	52	22	26	49	75	51	26
May	121	29	21	19	17	16	53	50	14	16	34	73	46	18
June	70	30	17	19	9	10	40	49	17	14	29	67	54	9

[1] Respiratory cases with none of the 13 symptoms checked as present were considered unknown for symptoms and excluded from symptom tabulations but included in incidence tabulations.

During the fall of 1923 and throughout 1924 there was no indication of any general excessive incidence of or mortality from influenza in the United States that could be called an epidemic. In the early months of 1925 certain sections of the country reported considerable influenza mortality (top of fig. 8), and in 1926 there was a respiratory outbreak which was quite general throughout the United States (8) (9). Although the incidence of the total respiratory cases among medical officers' families is not excessively high in the early months of 1925 and 1926, there are definite increases in attacks reported as influenza as compared with corresponding months in 1924. The period from

October 1923 to June 1926, during which respiratory reports were received, therefore includes epidemic and nonepidemic times, and the

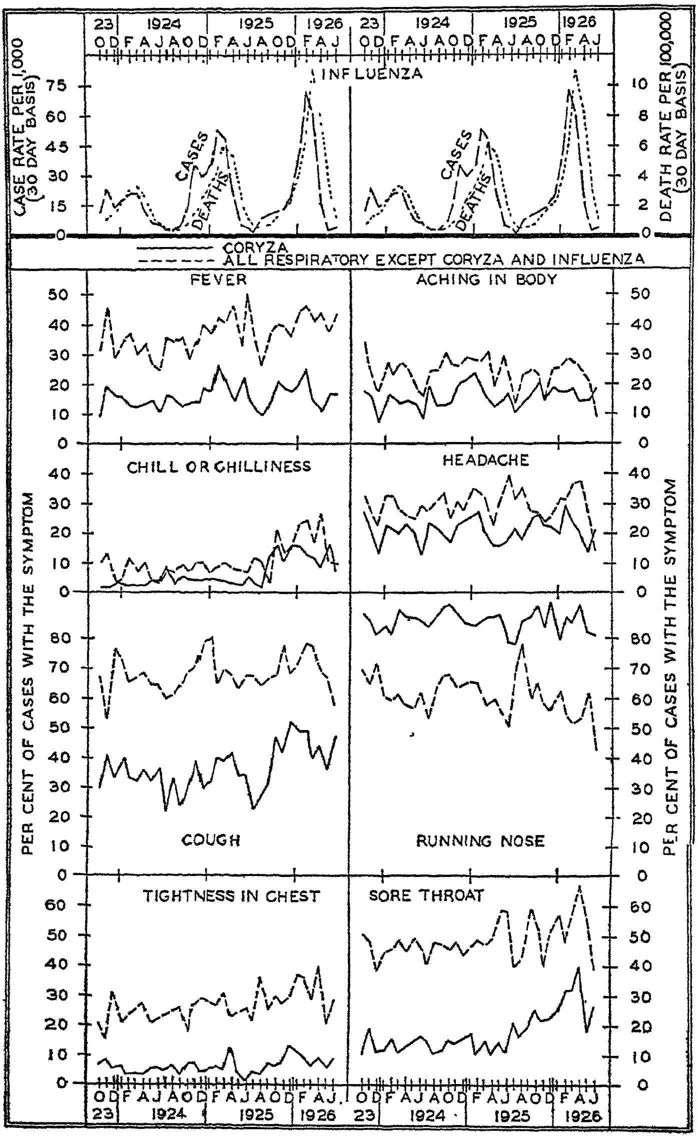

FIGURE 8.—Frequency of certain symptoms accompanying respiratory attacks not designated as influenza in different months in medical officers' families; monthly influenza case rates in medical officers' families and monthly influenza death rates in the registration area of the United States, 1923–26.

variation in the symptoms accompanying respiratory attacks in the different months is of special interest. The bottom part of figure 7

shows this variation in the proportion of respiratory attacks that were accompanied by certain symptoms. The ratios are expressed as the percent of cases with these symptoms, and the cases are classified according to the month of onset.

It has been seen that a greater frequency of nearly all symptoms is reported with influenza than with other respiratory attacks. Fever, aching in body, headache, and chilliness might be expected to occur with greater frequency during months when influenza is epidemic, because they are usually reported as accompanying influenza. February or March, or both, of 1925 and also of 1926 stand out as distinctly above adjacent months and above the corresponding months of 1924 for fever, aching in body, headache, cough, tightness in chest, and expectoration. Running nose and sore throat do not show peaks for these months.

Apart from greater frequency of certain symptoms during epidemics, cough, expectoration, and tightness in the chest all tend to have a rather definite seasonal variation, accompanying respiratory attacks in the winter more frequently than in the summer. The seasonal curves of fever, aching in body, and headache are all similar, with greater frequency in the winter, particularly in times when influenza reports are excessively high, but affecting other winter months also. Running nose and obstruction of the nostrils show less variation but tend to accompany respiratory attacks more frequently in late summer and early fall than in other seasons.

Part or all of the variation from month to month in the proportion of respiratory attacks accompanied by a given symptom may be due to the varying number of influenza cases included in the total respiratory attacks; more influenza would usually result in more of the general symptoms being reported. The differentiation of the various respiratory diagnoses is a difficult clinical task and a matter upon which there are wide differences of opinion. It is possible that many cases that exhibit general symptoms usually associated with influenza may have been reported as chest or head colds or sore throats or some combination of these diagnoses. It would seem of interest to see whether respiratory attacks reported under designations other than influenza show any tendency toward an increase in general symptoms such as fever or aching at times when influenza cases are reported in larger numbers. Data bearing on this point are shown in figure 8. Since coryza, or head colds, is such a large group, the symptoms are shown for this diagnosis and for all respiratory cases except coryza and influenza. In other words, these curves are for cases not designated as influenza by the informant. To facilitate comparison, the monthly incidence of influenza as reported in medical officers' families and the monthly mortality from influenza in the registration area of the United States are plotted at the top of the graph.

In both coryza and in other respiratory diagnoses not designated as influenza there is a definite tendency during the winter months toward a greater frequency of fever and aching in body and headache, with peaks of these general symptoms in coryza tending to occur in the months when influenza incidence was at its height. Other symptoms that show little or no increase in frequency in 1925 show a rather definite rise in the early months of 1926, when influenza was generally epidemic in the United States. Among these symptoms are chilliness, cough, tightness in chest, and sore throat.

SUMMARY

Records of the number and clinical symptoms of respiratory attacks were obtained by semimonthly reports on the families of medical officers of the United States Army, Navy, and Public Health Service and the faculty members in certain universities. The records extend over a period of 33 months ending June 30, 1926, with an average of 2,998 persons under observation during these months. These data are supplemented by a year's record for 1,872 students in seven universities who reported for every one of the 24 half months of 1924.

This paper deals largely with the symptoms of respiratory attacks reported under the designations of coryza, bronchitis, sore throat, and influenza. Diagnoses are used as reported and refer to cases with only one designated diagnosis, except in tabulations for all respiratory cases combined.

The annual respiratory incidence in the family group was 1,851 cases per 1,000, or nearly 2 cases per person per year. Of this total about half of the cases were reported as coryza or head colds only; another fourth was made up of influenza, sore throat, and bronchitis, while the remaining fourth were combinations of two or more of these diagnoses.

The annual respiratory incidence for the students was 3,333 per 1,000, or more than 3 cases per person per year. The students reported upon themselves only and probably remembered and included more trivial attacks. Nearly three fourths of the cases were reported as coryza or head cold only.

The family and student data agree in the general symptom picture for each diagnosis and in the differences between the four minor respiratory diagnoses (fig. 1).

The great majority of the symptoms occur with about equal frequency in attacks among males and females. Of 13 symptoms upon which information was obtained, constipation, obstruction of the nostrils, and expectoration were the only ones to show much difference, and these occurred with greater frequency among males than females (fig. 2).

There is considerable difference between the age curves of the incidence of the several reported respiratory diagnoses (fig. 3).

The percentage of respiratory attacks accompanied by given symptoms varies widely with age, and a few symptoms show definite differences between the sexes at specific ages (fig. 5).

These age differences persist in the symptoms of the several reported respiratory diagnoses. The four minor respiratory diagnoses differ widely in symptoms present at specific ages (fig. 6).

The seasonal incidence curves of the four minor respiratory diagnoses differ greatly. Coryza has its peak incidence in the fall and decreases thereafter; influenza incidence in the years under study was usually low in the fall with a peak in the late winter or early spring; bronchitis and sore throat lie between these extremes (fig. 7).

The percentage of respiratory attacks accompanied by given symptoms varies widely in different months of the same year and in the same months of different years. The general symptoms, such as fever, aching, and headache, are most frequent in attacks during months when influenza is prevalent (fig. 7).

Respiratory cases reported under some designation other than influenza show some tendency toward more frequent general symptoms, such as fever, aching, and headache, during months when influenza is prevalent (fig. 8).

ACKNOWLEDGMENTS

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COURT DECISIONS RELATING TO PUBLIC HEALTH

Issuance of certified copy of death record by local health officer upheld.—(Alabama Supreme Court; *Prudential Ins. Co.* v. *Calvin*, 148 So. 837; decided Mar. 16, 1933.) In an action on a life-insurance policy, one of the points raised before the supreme court was that the trial court—

committed reversible error in admitting, over defendant's timely objection, the paper purporting on its face to be "the death certificate" of Paul T. Calvin. This certificate was issued and signed by J. D. Dowling, M.D., Registrar, and beneath the word "Registrar" appear the capital letters B. R. This certificate is headed: "Jefferson County Board of Health, Birmingham, Alabama, Bureau of Records and Vital Statistics." Transcript of the record of death, Birmingham, Ala., June 15, 1932.

The supreme court said that it would "take judicial knowledge of the fact that Dr. Dowling was health officer of Jefferson County on June 15, 1932, and that certificate in question was issued by him as the registrar".

Concerning the contention that "the certificates of births and deaths must be obtained from the State registrar under the provisions of section 1087 of the code (as amended by Gen. Acts 1927, p. 780)", the court stated as follows:

* * * Of course, the State registrar may issue certificates of births and deaths, but he is not the only officer that has such authority. We are fully persuaded that, under section 7674 of the code, Dr. Dowling was authorized to make and furnish the certificate and that the same, as for any grounds of objection urged thereto, was properly admitted in evidence. * * *

Section 7674, referred to by the court, provided:

Registers of marriages, births, and deaths, kept in pursuance of law or any rule of a church or religious society, may be certified by the custodian thereof; and, when so certified, are presumptive evidence of the facts therein stated as well as of the law or rule in pursuance of which such registry was made and of the authority to certify the same.

Making changes in death record on file with State health authorities.—(Tennessee Supreme Court; *Continental Casualty Co.* v. *Nashville & American Trust Co. et al.*, 61 S.W. (2d) 461; decided June 24, 1933.) The plaintiff company had insured a certain named person against loss of life by accidental means, but expressly excluded coverage in the

event of suicide. The body of the insured was found one evening suspended from a rope attached to an electric fixture on the wall of his bedroom. A physician who had attended him earlier in the day was called and, after examining the body, filed a death certificate in which he ascribed death to suicide by strangulation. About 10 months later an inquest was held, in which the jury found that the insured died as a result of external violence or homicide. The record of the inquest was presented to and filed with the State bureau of vital statistics with the request that the previous record be corrected to conform with the finding of the inquest.

The insurance company brought action to have the coroner's proceedings declared void and to enjoin the defendants from using the record of the inquest as evidence. The defendants, by crossbill, asked the court to correct the record of the bureau of vital statistics by supplanting the first certificate with the subsequent certificate of the coroner. The lower court dismissed the defendants' crossbill and sustained the plaintiff's bill to the extent of holding the coroner's inquest void. In concurring with the lower court upon the result the supreme court said:

> * * * When the certificate of Dr. Buckner [the attending physician] was filed and recorded by the registrar, it became a public record. Neither the superintendent of the bureau of vital statistics nor the commissioner of the State board of health had authority to institute an inquest 9 or 10 months after the record in the bureau of vital statistics was made, and that record could not be supplanted by the unrelated proceeding of the coroner. The subsequent coroner's inquest, insofar as it was designed to impair the verity of the record of the bureau of vital statistics, is void.
>
> Whether the coroner's verdict as the record of criminal procedure is void is immaterial to this determination. It is sufficient to say that the registrar of the bureau of vital statistics had no authority to file the record of the coroner, because it has no place among his records. The chancellor very properly refused to perpetuate the injunction because the question of whether or not the coroner's inquest could be used as evidence on a trial between the insured and the insurance company over the right to recover the insurance is matter for the determination of the court trying the case.

DEATHS DURING WEEK ENDED SEPTEMBER 2, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Sept. 2, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	6,855	6,919
Deaths per 1,000 population, annual basis	9.6	9.9
Deaths under 1 year of age	527	585
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	45	48
Deaths per 1,000 population, annual basis, first 35 weeks of year	11.0	11.4
Data from industrial insurance companies:		
Policies in force	67,907,473	70,963,568
Number of death claims	10,695	11,026
Death claims per 1,000 policies in force, annual rate	8.2	8.1
Death claims per 1,000 policies, first 35 weeks of year, annual rate	10.0	9.8

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended September 9, 1933, and September 10, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 9, 1933, and Sept. 10, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Sept. 9, 1933	Week ended Sept. 10, 1932	Week ended Sept. 9, 1933	Week ended Sept. 10, 1932	Week ended Sept. 9, 1933	Week ended Sept. 10, 1932	Week ended Sept. 9, 1933	Week ended Sept. 10, 1932
New England States:								
Maine			1		1	7	0	0
New Hampshire					2		0	0
Vermont					1		0	0
Massachusetts	10	12		1	16	22	0	0
Rhode Island		2			1	2	0	0
Connecticut	3	1	1		6	3	1	1
Middle Atlantic States:								
New York	27	39	[1] 9	[1] 4	57	78	2	3
New Jersey	7	13	3	4	8	24	0	1
Pennsylvania	24	39			25	33	3	5
East North Central States:								
Ohio [2]	27	24	7	4	6	28	0	2
Indiana	20	38	30	13	2	4	3	2
Illinois	17	41	10	5	8	17	5	3
Michigan	16	6	2		10	16	0	1
Wisconsin	4	9	13	20	31	10	1	3
West North Central States:								
Minnesota	4	4	3		7	4	0	1
Iowa [3 4]	14	3				1	0	0
Missouri	26	25			4	1	1	5
North Dakota	4				10	5	0	0
South Dakota	2	1			2		1	0
Nebraska	7	13			2	2	1	0
Kansas	7	14	1	1	8	5	1	1
South Atlantic States:								
Delaware		2					0	0
Maryland [2 3]	1	13	2	5	2	3	0	0
District of Columbia	5	1			1	1	0	0
Virginia [4]	37	30			22	7	2	3
West Virginia	49	27	21	3	47	10	1	0
North Carolina [4]	58	58		9	9	12	0	2
South Carolina [2]	19	12	95	161	21	6	0	0
Georgia [2]	32	36		15	15	2	0	1
Florida [2]	5	9	1		1	1	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 9, 1933, and Sept. 10, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Sept. 9, 1933	Week ended Sept. 10, 1932	Week ended Sept. 9, 1933	Week ended Sept. 10, 1932	Week ended Sept. 9, 1933	Week ended Sept. 10, 1932	Week ended Sept. 9, 1933	Week ended Sept. 10, 1932
East South Central States:								
Kentucky	26	62					0	1
Tennessee	66	56	14	19	7	1	0	0
Alabama [2]	63	68	26	3	1	1	1	0
Mississippi [3]	29	30					0	0
West South Central States:								
Arkansas	20	23	2		10	1	0	0
Louisiana	10	22	5	7		1	0	0
Oklahoma [5]	67	47	25	13	3	1	0	1
Texas [2]	64	71	104	41	14	2	1	0
Mountain States:								
Montana	2	1	1	2	1	29	0	0
Idaho							1	1
Wyoming					4	2	0	1
Colorado	1	3			3		0	0
New Mexico	5	7		3	1	1	0	1
Arizona			3	1	2	1	0	0
Utah [3]		1			4	1	0	0
Pacific States:								
Washington	4	3			4	5	0	1
Oregon		2	6	3	7	4	0	0
California	24	26	9	81	40	25	2	1
Total	806	894	394	418	426	379	27	41

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Sept. 9, 1933	Week ended Sept. 10, 1932	Week ended Sept. 9, 1933	Week ended Sept. 10, 1932	Week ended Sept. 9, 1933	Week ended Sept. 10, 1932	Week ended Sept. 9, 1933	Week ended Sept. 10, 1932
New England States:								
Maine	5	1	3	2	0	0	1	5
New Hampshire	0	0	4	4	0	0	0	0
Vermont	2	0	3	4	0	0	0	0
Massachusetts	23	4	53	49	0	0	7	7
Rhode Island	1	2	3	6	0	0	1	0
Connecticut	6	2	10	11	0	0	3	2
Middle Atlantic States:								
New York	123	20	38	63	0	2	50	48
New Jersey	38	30	33	22	0	0	5	9
Pennsylvania	25	136	101	91	0	0	40	75
East North Central States:								
Ohio [2]	27	2	155	145	0	9	81	85
Indiana	2	1	48	33	2	0	11	34
Illinois	8	8	128	57	0	0	49	44
Michigan	7	9	52	43	0	1	39	44
Wisconsin	0	1	16	17	6	0	1	10
West North Central States:								
Minnesota	25	9	23	17	0	0	0	1
Iowa [3] [4]	2	7	11	9	0	1	5	4
Missouri	3	1	29	22	0	0	10	35
North Dakota	11	2	2	4	0	0	3	6
South Dakota	2	1	8	0	0	0	4	1
Nebraska	4	2	18	11	0	0	3	2
Kansas	5	0	51	35	0	0	21	14
South Atlantic States:								
Delaware	0	2	4	1	0	0	5	1
Maryland [2] [3]	1	2	12	10	0	0	17	32
District of Columbia	1	3	3	5	0	0	2	2
Virginia [4]	3	5	48	44	0	0	34	52
West Virginia	5	8	41	32	0	4	53	79
North Carolina [4]	1	3	40	31	0	0	15	20
South Carolina [2]	0	1	2	2	0	0	31	43
Georgia [2]	0	0	7	9	0	0	21	54
Florida [2]	0	0	2	3	0	0	2	5
East South Central States:								
Kentucky	3	2	72	62	0	1	43	65
Tennessee	11	1	60	31	1	1	75	48
Alabama [2]	2	0	29	45	0	0	21	24
Mississippi [3]	1	0	12	9	0	0	23	22

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 9, 1933, and Sept. 10, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Sept. 9, 1933	Week ended Sept. 10, 1932	Week ended Sept. 9, 1933	Week ended Sept. 10, 1932	Week ended Sept. 9, 1933	Week ended Sept 10, 1932	Week ended Sept. 9, 1933	Week ended Sept. 10, 1932
West South Central States:								
Arkansas	0	0	6	13	0	0	10	47
Louisiana	1	0	9	4	0	0	20	21
Oklahoma [5]	1	0	17	16	0	0	54	56
Texas [2]	1	4	28	26	4	2	65	50
Mountain States:								
Montana	0	0	8	6	0	0	7	6
Idaho	0	0	0	2	0	0	2	0
Wyoming	0	0	4	7	0	0	2	0
Colorado	2	0	5	8	1	0	19	8
New Mexico	0	1	2	5	0	0	14	3
Arizona	1	0	1	4	0	0	13	1
Utah [3]	1	0	2	2	0	0	1	0
Pacific States:								
Washington	3	1	9	5	0	0	3	5
Oregon	1	0	10	8	3	3	4	5
California	3	4	69	46	2	3	13	15
Total	361	284	1,311	1,081	19	27	903	1,090

[1] New York City only.
[2] Typhus fever, week ended Sept. 9, 1933, 70 cases, as follows: Ohio, 1; Maryland, 1; South Carolina, 3; Georgia, 22; Florida, 3; Alabama, 32; Texas, 8.
[3] Week ended earlier than Saturday.
[4] Rocky Mountain spotted fever, week ended Sept. 9, 1933, 7 cases, as follows: Iowa, 1; Virginia, 3; North Carolina, 3.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
May 1933										
Missouri	17	79	12	2	954		0	278	12	21
August 1933										
Arkansas		42	7	1,092	120	99	1	15	2	106
Connecticut		11	10	1	49		17	57	0	13
District of Columbia	1	29	1		19	1	1	20	0	7
New Mexico		21		34	9	3	2	10	4	34
North Dakota	6	26	10		68		20	28	0	6
Vermont		2			14		4	17	0	2

May 1933

	Cases
Missouri:	
Chicken pox	188
Mumps	407
Rabies in animals	12
Septic sore throat	12
Undulant fever	1
Whooping cough	77

August 1933

	Cases
Anthrax:	
Arkansas	2
Chicken pox:	
Arkansas	19
Connecticut	36
District of Columbia	6
New Mexico	75
North Dakota	20
Vermont	10

August 1933—Continued

	Cases
Conjunctivitis, infectious:	
Connecticut	1
Dengue:	
Arkansas	1
Dysentery, bacillary:	
Connecticut	2
German measles:	
Connecticut	1
North Dakota	2
Lead poisoning:	
Connecticut	1
Lethargic encephalitis:	
Connecticut	4
North Dakota	4
Mumps:	
Arkansas	3
Connecticut	31

August 1933—Continued

	Cases
Mumps—Continued	
New Mexico	17
Vermont	21
Ophthlamia neonatorum:	
Arkansas	1
North Dakota	1
Paratyphoid fever:	
Arkansas	1
Connecticut	1
Puerperal septicemia:	
New Mexico	1
Rabies in animals:	
Connecticut	7
Rocky Mountain spotted fever:	
District of Columbia	1

August 1933—Continued

	Cases
Scabies:	
North Dakota	2
Septic sore throat:	
Connecticut	2
New Mexico	1
Tetanus:	
Connecticut	1
Trachoma:	
Arkansas	1

August 1933—Continued

	Cases
Trachoma—Continued	
Connecticut	1
North Dakota	2
Typhus fever:	
Arkansas	1
Undulant fever:	
Arkansas	1
Connecticut	4
Vermont	1

August 1933—Continued

	Cases
Vincent's infection:	
North Dakota	13
Whooping cough:	
Arkansas	80
Connecticut	119
District of Columbia	44
New Mexico	35
North Dakota	34
Vermont	43

LETHARGIC ENCEPHALITIS, ST. LOUIS, MO.[1]

From July 31 to September 13, 1933, 441 cases of lethargic encephalitis were reported in the county of St. Louis, Mo., and 358 cases in St. Louis city. The total for the period was 799 cases with 138 deaths. The latest report stated that the epidemic was decreasing.

WEEKLY REPORTS FROM CITIES

City reports for week ended Sept. 2, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	0	0	1	0	0	1	5	18
New Hampshire:											
Concord	0	------	0	0	2	0	0	0	0	0	14
Nashua	0	------	0	2	0	0	0	0	0	0	9
Vermont:											
Barre	0	------	0	0	1	0	0	0	0	2	3
Burlington	0	------	0	0	0	1	0	0	0	0	8
Massachusetts:											
Boston	3	------	0	7	5	22	0	5	0	45	168
Fall River	0	------	0	0	2	1	0	2	0	0	25
Springfield	0	------	0	1	0	1	0	2	0	2	24
Worcester	0	------	0	15	4	5	0	3	0	0	--------
Rhode Island:											
Pawtucket	0	------	0	0	0	0	0	0	0	0	13
Providence	0	------	0	0	0	6	0	2	1	32	52
Connecticut:											
Bridgeport	0	------	0	0	1	1	0	0	8	0	28
Hartford	0	------	0	4	1	2	0	0	0	1	34
New Haven	0	------	1	0	1	0	0	1	1	3	36
New York:											
Buffalo	0	------	0	2	19	2	0	4	0	39	116
New York	11	1	4	12	77	22	0	83	36	119	1,207
Rochester	0	------	0	1	2	3	0	0	0	9	39
Syracuse	0	------	0	0	1	0	0	0	0	8	35
New Jersey:											
Camden	2	------	0	0	1	2	0	2	0	0	28
Newark	0	1	0	0	4	1	0	5	0	36	82
Trenton	0	------	0	0	1	3	0	0	0	4	22
Pennsylvania:											
Philadelphia	3	1	0	10	12	13	0	22	4	9	378
Pittsburgh	1	------	0	1	13	6	0	5	1	49	133
Reading	0	------	0	1	1	1	0	0	0	6	17
Ohio:											
Cincinnati	2	------	0	1	4	6	0	6	13	19	104
Cleveland	3	23	1	1	8	8	0	9	1	32	141
Columbus	0	1	1	0	0	13	0	3	1	2	63
Toledo	0	------	0	1	0	8	0	1	1	8	62
Indiana:											
Fort Wayne	2	------	0	0	1	0	0	2	0	0	29
Indianapolis	0	------	0	2	3	3	0	3	2	3	--------
South Bend	0	------	0	0	0	1	0	0	0	2	18
Terre Haute	0	------	0	0	1	0	0	1	0	0	11
Illinois:											
Chicago	3	------	3	3	26	40	0	48	5	49	565
Springfield	0	------	0	0	0	1	0	0	1	1	14
Michigan:											
Detroit	8	1	2	2	3	7	0	18	2	69	199
Flint	2	------	0	0	1	4	0	0	3	4	15
Grand Rapids	0	------	0	0	0	2	0	1	0	12	20

[1] See pages 1182 and 1185 for other reports on lethargic encephalitis.

City reports for week ended Sept. 2, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Wisconsin:											
Kenosha	1	------	0	1	0	0	0	0	0	5	7
Milwaukee	0	------	0	0	3	4	0	4	0	90	89
Racine	0	------	0	0	0	0	0	0	0	20	8
Superior	0	------	0	0	0	0	0	0	0	2	11
Minnesota:											
Duluth	0	------	0	0	0	1	0	0	2	0	29
Minneapolis	1	------	0	1	0	2	0	1	0	1	69
St. Paul	0	------	0	0	1	3	0	1	0	23	54
Iowa:											
Des Moines	8	------	0	0	0	2	0	0	0	0	29
Sioux City	1	------	--------	0	-------	2	0	-------	0	2	--------
Waterloo	0	------	--------	0	-------	0	0	-------	0	2	--------
Missouri:											
Kansas City	1	------	0	0	5	2	0	3	0	6	89
St. Joseph	2	------	0	0	2	0	0	0	0	0	17
St. Louis	9	------	--------	11	6	5	0	10	4	10	219
North Dakota:											
Fargo	0	------	0	4	0	0	0	0	0	1	3
Grand Forks	0	------	0	0	0	0	0	0	0	0	0
South Dakota:											
Aberdeen	0	------	0	0	0	0	0	0	0	0	0
Nebraska:											
Omaha	3	------	0	0	0	4	0	0	0	5	32
Kansas:											
Topeka	3	------	0	1	2	1	0	0	0	0	33
Wichita	0	------	0	0	2	3	0	1	1	0	24
Delaware:											
Wilmington	1	------	0	0	1	[illegible]	0	0	0	1	26
Maryland:											
Baltimore	0	1	2	2	9	6	0	14	0	55	191
Cumberland	0	------	0	0	0	0	0	0	0	0	14
Frederick	0	------	0	0	0	0	0	0	1	0	1
District of Columbia:											
Washington	1	------	0	1	5	2	0	7	1	3	129
Virginia:											
Lynchburg	2	------	0	4	0	0	0	0	0	2	9
Richmond	4	------	0	1	0	1	0	2	1	0	44
Roanoke	6	------	0	0	0	0	0	0	4	0	10
West Virginia:											
Charleston	5	------	0	0	0	0	0	0	2	0	17
Huntington	1	------	0	0	0	4	0	0	0	0	0
Wheeling	0	------	0	0	0	1	0	2	1	0	17
North Carolina:											
Raleigh	1	------	0	0	1	3	0	0	0	2	14
Wilmington	0	------	0	0	1	1	0	0	0	0	17
Winston-Salem	3	------	0	2	0	3	0	2	2	2	17
South Carolina:											
Charleston	2	5	0	0	1	0	0	3	1	3	17
Greenville	0	------	0	0	1	0	0	0	0	0	14
Georgia:											
Atlanta	12	15	1	1	4	1	0	6	-------	8	66
Savannah	1	1	0	0	1	1	0	1	1	1	25
Florida:											
Miami	1	------	0	0	2	0	0	3	1	0	35
Tampa	3	------	0	0	1	1	0	1	0	0	23
Kentucky:											
Ashland	0	------	0	0	0	0	0	0	1	11	0
Lexington	0	------	0	0	2	2	0	2	2	0	21
Louisville	6	------	0	0	4	5	0	2	2	1	74
Tennessee:											
Memphis	0	------	0	3	4	0	0	8	7	6	79
Nashville	4	------	0	1	2	7	0	0	6	0	47
Alabama:											
Birmingham	4	1	0	0	0	2	0	3	4	2	49
Mobile	4	------	0	0	1	0	0	1	1	0	14
Montgomery	1	------	--------	0	-------	1	0	-------	0	0	--------
Arkansas:											
Fort Smith	1	------	--------	0	-------	0	0	-------	0	0	--------
Little Rock	0	------	0	3	0	0	0	3	0	0	3
Louisiana:											
New Orleans	6	2	2	0	10	5	0	11	4	0	149
Shreveport	1	------	0	0	7	1	0	0	0	0	28
Oklahoma:											
Oklahoma City	2	3	0	0	6	4	0	6	0	0	42
Tulsa	1	------	0	0	0	3	0	0	5	0	

City reports for week ended Sept. 2, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Texas:											
Dallas	5	1	1	0	3	2	1	2	2	5	50
Fort Worth	0		0	0	1	0	0	2	4	0	27
Galveston	0		0	0	0	0	0	0	0	0	15
Houston	7		0	0	2	1	0	3	0	0	58
San Antonio	5		0	0	4	1	0	5	0	0	56
Montana:											
Billings	0		0	0	0	0	0	0	0	1	5
Great Falls	0		0	0	1	0	0	0	0	1	9
Helena	0		0	0	0	0	0	0	0	0	1
Missoula	0		0	0	0	0	0	0	0	0	6
Colorado:											
Denver	0	16	0	4	4	3	1	4	2	5	70
Pueblo	0		0	0	0	0	0	0	0	2	7
New Mexico:											
Albuquerque	0		0	0	0	0	0	4	1	4	14
Utah:											
Salt Lake City	0		0	1	0	0	0	1	1	7	20
Nevada:											
Reno	0		0	0	0	0	0	0	0	0	3
Washington:											
Seattle	0			1	3	1	0	7	0	14	
Spokane	0			7	2	0	0		1	0	25
Tacoma	0		0	0	0	1	0	0	0	2	21
Oregon:											
Portland	1		1	1	2	5	1	0	0	1	58
Salem	0		0	0	0	0	0	0	0	0	0
California:											
Los Angeles	21	3	0	11	9	15	1	16	1	48	246
Sacramento	0		0	0	1	0	0	7	0	2	34
San Francisco	2	3	0	2	1	6	0	10	0	13	163

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts:			
Boston	1	0	13
Worcester	0	0	3
Rhode Island:			
Pawtucket	0	0	1
Providence	0	0	2
Connecticut:			
Bridgeport	0	0	1
New York:			
New York	0	3	115
Rochester	0	0	1
Syracuse	0	0	2
New Jersey:			
Newark	0	0	4
Trenton	0	0	1
Pennsylvania:			
Philadelphia	0	0	1
Pittsburgh	1	0	0
Reading	1	0	0
Ohio:			
Cincinnati	0	0	1
Cleveland	1	0	9
Indiana:			
Fort Wayne	0	0	2
Indianapolis	3	1	0
South Bend	0	0	1

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Illinois:			
Chicago	1	1	11
Michigan:			
Detroit	0	0	1
Grand Rapids	0	0	1
Minnesota:			
Duluth	0	0	2
Minneapolis	0	0	10
St. Paul	0	0	2
Missouri:			
St. Louis	0	0	1
North Dakota:			
Fargo	0	0	1
Delaware:			
Wilmington	1	0	0
Maryland:			
Baltimore	0	0	1
Cumberland	0	0	1
Tennessee:			
Memphis	0	0	1
Nashville	0	0	2
Washington:			
Seattle	0	1	1

Lethargic encephalitis.—Cases: Portland, Maine, 1; New York City, 9; Philadelphia, 2; Pittsburgh, 3; Cleveland, 5; Chicago, 1; Detroit, 2; Grand Rapids, 2; Racine, 1; Minneapolis, 2; Kansas City, Mo., 5; St. Louis, 151; Omaha, 3; Louisville, Ky., 4; Birmingham, 2; Denver, 2; Pueblo, Colo., 1.

Typhus fever.—Cases: Charleston, S.C., 4; Savannah, 4; Birmingham, 1; Mobile, 1. Deaths: San Antonio, 1.

Pellagra.—Cases: Charleston, S.C., 3; Atlanta, 1; Montgomery, Ala., 1; New Orleans, 1; Albuquerque, 1; Los Angeles, 1.

FOREIGN AND INSULAR

ARGENTINA

Buenos Aires—Typhus fever—Correction.—The report of 6 cases of typhus fever in Buenos Aires, Argentina, during the week ended January 28, 1933, which has appeared in the cumulative table published each month in the PUBLIC HEALTH REPORTS, is an error. There was no typhus fever in Buenos Aires at that time.

CANADA

Provinces—Communicable diseases—2 weeks ended August 26, 1933.—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the 2 weeks ended August 26, 1933, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis					1	1	1			3
Chicken pox		4		23	53	9	8	1	21	119
Diphtheria	2	6	2	32	17	13	2		2	76
Erysipelas				6	2	2				10
Influenza		5		1		1			2	9
Lethargic encephalitis				1						1
Measles		1		28	10		3	1	6	49
Mumps					25	1	8		3	37
Paratyphoid fever		4			17	1				22
Pneumonia							7		6	13
Poliomyelitis				4	7		8	8		27
Scarlet fever		8	8	49	35	17	2	9	7	135
Smallpox						1				1
Trachoma					15		11		21	47
Tuberculosis	4	1	7	114	73	15	39	3	32	288
Typhoid fever		1	6	84	35	3	1	1	3	134
Undulant fever					4				1	5
Whooping cough		13	8	168	303	84	35	8	12	631

Ontario Province—Communicable diseases—Five weeks ended July 29, 1933.—The Department of Health of the Province of Ontario, Canada, reports certain communicable diseases for the 5 weeks ended July 29, 1933, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	10	6	Pneumonia		77
Chicken pox	728		Poliomyelitis	4	1
Diphtheria	38	2	Puerperal septicemia		1
Dysentery	1		Scarlet fever	207	
Erysipelas	1		Septic sore throat	21	1
German measles	8		Syphilis	240	1
Gonorrhea	283		Tetanus		2
Influenza		2	Tuberculosis	196	47
Measles	184	1	Typhoid fever	34	2
Mumps	180		Undulant fever	22	
Paratyphoid fever	6		Whooping cough	574	2

GREAT BRITAIN

Scotland—Vital statistics—Quarter ended June 30, 1933.—The Registrar General of Scotland has published the following statistics for the second quarter of the year 1933:

Population (estimated)	4,916,000	Deaths from—Continued	
Births	23,212	Influenza	135
Birth rate per 1,000 population	18.9	Lethargic encephalitis	21
Deaths	15,121	Measles	13
Death rate per 1,000 population	12.3	Nephritis, acute	69
Marriages	8,176	Nephritis, chronic	266
Deaths under 1 year	1,704	Nephritis, unspecified	89
Deaths under 1 year per 1,000 births	73	Pneumonia, lobar	319
Deaths from:		Pneumonia, unspecified	176
Bronchitis	379	Poliomyelitis	6
Broncho-pneumonia	470	Puerperal sepsis	43
Cancer	1,862	Scarlet fever	52
Cerebrospinal fever	56	Syphilis	24
Diabetes	154	Tetanus	3
Diphtheria	76	Tuberculosis	1,043
Dysentery	3	Typhoid fever	5
Erysipelas	43	Whooping cough	251
Heart disease	2,494		

ITALY

Communicable diseases—4 weeks ended April 30, 1933.—During the 4 weeks ended April 30, 1933, cases of certain communicable diseases were reported in Italy as follows:

Disease	Apr. 3-9		Apr. 10-16		Apr. 17-23		Apr. 24-30	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	15	14	11	10	7	7	9	9
Cerebrospinal meningitis	25	21	10	10	15	10	11	10
Chicken pox	448	131	359	106	418	128	478	148
Diphtheria and croup	644	320	425	257	461	253	474	253
Dysentery	3	3	1	1	3	3		
Lethargic encephalitis	6	5	3	3	2	2	1	1
Measles	1,849	246	1,409	223	1,727	270	1,801	268
Poliomyelitis	10	10	7	6	3	3	7	7
Scarlet fever	403	142	338	128	345	125	369	136
Typhoid fever	205	117	190	107	173	97	217	120

JAMAICA

Communicable diseases—4 weeks ended August 12, 1933.—During the 4 weeks ended August 12, 1933, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island of Jamaica, outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis	1		Puerperal fever		6
Chicken pox		11	Scarlet fever		1
Diphtheria	1	3	Tuberculosis	23	98
Dysentery	7	13	Typhoid fever	28	85
Leprosy		1			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Aug. 25, 1933, pp. 1056–1068. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Sept. 29, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Philippine Islands.—During the week ended September 9, 1933, cholera was reported in the Philippine Islands as follows: Leyte Province, Sogod, 1 case, 1 death; Cebu Province, Mundawe, 1 case, 1 death, Olongapo Island, 8 cases, 6 deaths.

Plague

France—Marseille.—A report has been received on the recent occurrence of cases of bubonic plague on board the S. S. *D'Artagnan* in the port of Marseille, France. The vessel arrived at Marseille from Saigon, Indo-China, June 10, 1933, and was placed out of commission for reconditioning and her crew and officers quartered on board. On August 6, two members of the crew became ill, and the disease was diagnosed as bubonic plague. Both of these patients died. The vessel was taken to a buoy in the harbor and 94 members of the crew were placed in isolation. Six additional cases occurred among members of the crew, with 1 additional death on August 9. Antiplague serum was administered, and the other 5 patients have progressed to convalescence. The vessel was fumigated with sulphur anhydride, and 320 rats were recovered. None of these rats was reported to be plague-infected. On July 17, 24 and 25, one dead rat was brought to the port laboratory each day, and all were found to be plague-infected. These rats were picked up on the wharf near the S. S. *D'Artagnan.*

Iraq—Baghdad.—During the week ended September 2, 1933, 1 case of plague was reported at Baghdad, Iraq.

Typhus Fever

Chile.—During the week ended August 26, 1933, about 10 new cases of typhus fever were reported in the Province of Aconcagua, Chile. Five of the cases occurred in Valparaiso, 3 in Calera, and 1 in Limache.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

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SEPTEMBER 29 - - 1933

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Sickness Among Male Industrial Employees, 2d Quarter, 1933
List of Recent Publications of the Public Health Service
Deaths in Large Cities During Week Ended September 9
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 48 SEPTEMBER 29, 1933 NO. 39

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES[1]

August 13–September 9, 1933

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the PUBLIC HEALTH REPORTS, under the section entitled "Prevalence of Disease".

Poliomyelitis.—The number of cases of poliomyelitis increased from 667 for the preceding 4 weeks to 1,412 for the 4 weeks ended September 9. The disease continued most prevalent in the New England, Middle Atlantic, East North Central, and West North Central areas. In Massachusetts the number of cases rose from 92 to 135; in New York from 245 to 557; in New Jersey from 18 to 84; in Pennsylvania from 44 to 130; in Ohio from 28 to 81; in Illinois from 27 to 55; in Michigan from 8 to 21; in Minnesota from 35 to 91; in North Dakota from 13 to 27. In West Virginia and Tennessee, while the numbers of cases were below those of the preceding period, the incidence was still rather high.

The total number of cases (1,412) was 1.4 times that recorded last year for the corresponding period. For this period in 1931, 1930, and 1929 the numbers of cases were 4,986, 1,392, and 486, respectively.

A comparison of geographic areas shows that the disease is most prevalent in the same regions in which it first appeared in epidemic-like form in 1931. In the New England States 183 cases were reported for the current period, as against 104 last year; in the Middle Atlantic area 771 cases, as against 307; in the East North Central area 170, as against 69; in the West North Central area 159, as against 73. Exclusive of the 19 cases reported from West Virginia, the South Atlantic States reported only 28 cases, which was the lowest incidence

[1] From the Office of Statistical Investigations, U.S. Public Health Service. The numbers of States included for the various diseases are as follows: Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 47; diphtheria, 48; scarlet fever, 48; influenza, 38 States and New York City. The District of Columbia is counted as a State in these reports.

These summaries include only the eight important communicable diseases for which the Public Health Service receives regular weekly reports from the State health officers. Reports on lethargic encephalitis will be found on pp. 1201, 1202 and 1204.

in that area in recent years. Excluding the 29 cases reported from Tennessee, the same situation existed in the East South Central States. From the West South Central and Far Western States only the normal seasonal incidence was reported.

Typhoid fever.—The incidence of typhoid fever was considerably below the level for recent years. For the current 4-week period the number of cases was 3,450, as compared with 4,520, 3,914, and 4,020 for the corresponding period in the years 1932, 1931, and 1930, respectively. The current incidence very closely approximated that in 1929, when the number of cases for this period was 3,418. Each geographic area except the Mountain reported a decline from last year's incidence. In that area the number of cases (155) was 1.7 times the number reported last year. Only a slight decline was reported from the Pacific area. Last year, while practically all other areas were reporting the highest incidence of typhoid for this period in recent years, the incidence in the Mountain and Pacific areas was the lowest in the 4 years for which data were available.

Smallpox.—The smallpox situation continued very favorable during the current period. The number of cases reported (83) was only about 55 percent of the very low figure reported for this period last year. It was the lowest for this period in the 5 years for which data are available. The New England and Middle Atlantic areas remained free from the disease, and only two cases were reported from the West North Central States. Other areas closely approximated last year's incidence, and the Mountain and Pacific areas each reported a decrease of more than 50 percent from last year.

Influenza.—The influenza situation was very favorable in all sections of the country. For the 4 weeks ended September 9 the number of cases was 1,175, as compared with 1,463, 1,011, and 875 for the corresponding period in the years 1932, 1931, and 1930.

Meningococcus meningitis.—The incidence of meningococcus meningitis reached the lowest level for the current year during the 4 weeks ended September 9. Compared with preceding years the incidence (129 cases) was the lowest recorded for this period in the 5 years for which data are available. In the East North Central States the number of cases dropped from 48 for the preceding 4 weeks to 28 for the current period, and in the West South Central 15 cases were reported last year as against 5 this year. In the Pacific area the [illegible]umber of cases rose from 6 last year to 13 for the current period. [illegible]r areas closely approximated last year's incidence.

[illegible]*htheria.*—The incidence of diphtheria during the 4 weeks [illegible]eptember 9 more closely approximated that of last year than [illegible] other 4-week period of the current year. The number of [illegible]ported was 2,692, which represented only a 10 percent decrease [illegible]st year's figure for the same period. For this period in the

years 1931, 1930, and 1929 the numbers of cases were 3,130, 2,546, and 3,727, respectively. The cases were widely distributed, no area reporting more than the usual seasonal incidence.

Scarlet fever.—The number of cases of scarlet fever reported for the current period was 4,380, which, for the country as a whole, was the highest incidence reported for this period in the 5 years for which data are available. All sections contributed to the increase except the New England, Middle Atlantic, and Mountain areas. In those regions the incidence was slightly below that of last year. In each of the regions showing an increase the number of cases was only about 10 percent above the figure for last year. In 1932, 1931, and 1930 there were 4,048, 3,887, and 2,852 cases, respectively.

Measles.—Practically all sections of the country reported a continued seasonal decrease of measles during the current 4-week period. The total number of cases (2,247) compared very favorably with the average for recent years (approximately 2,200 cases). The disease was most prevalent in the West North Central and East and West South Central areas. While the numbers of cases in each of these areas were not large (297, 88, and 165), they were considerably in excess of the numbers reported for this period last year. The New England, Middle Atlantic, and East North Central areas reported significant decreases from last year's figures.

Mortality from all causes.—The average death rate from all causes in large cities, as reported by the Bureau of the Census, for the current period was 9.3 per 1,000 inhabitants (annual basis). The rate is the lowest for this period in recent years for which data are available. For the corresponding 4 weeks in 1932 the rate was 9.4.

SICKNESS AMONG MALE INDUSTRIAL EMPLOYEES DURING THE SECOND QUARTER OF 1933[1]

By Dean K. Brundage, *Statistician, Office of Industrial Hygiene and Sanitation, United States Public Health Service*

An unusually low incidence rate of illness causing disability for more than 7 days occurred in the second quarter of 1933 among the male employees of 32 industrial establishments which reported the cases occurring among the members of their sick-benefit funds. The rate was only 70.5 cases per 1,000 males per year as compared with 93.1 for the same establishments in the second quarter of 1932. In the corresponding period of 1929, 1930, and 1931 the rates were 104.4, 96.1, and 89.6, respectively.

Both respiratory and nonrespiratory diseases decreased in frequency, but the percentage change was much greater in the respiratory

[1] The report for the first quarter was published in the Public Health Reports of July 7, 1933.

group. For nonindustrial injuries a very substantial decrease also was indicated.

In the respiratory group the influenza rate was only one half that found in the like period of 1932. Pneumonia occurred at the lowest incidence hitherto recorded for the second quarter. The frequency of new cases of tuberculosis was higher than in the like period of 1932, but was the same as in the corresponding quarter of 1931. The minor respiratory diseases, e.g., bronchitis and diseases of the pharynx and tonsils, showed material decreases as compared with earlier years. For all other respiratory diseases as a group the second quarter incidence rate was also low.

In the nonrespiratory group nearly all of the numerically important diseases participated in the general decrease in sickness frequency recorded for the industrial workers under consideration. The "minor" digestive diseases, which include diseases of the stomach and diarrhea and enteritis, showed for the recent quarter year a lower rate than in any 1 of the 4 preceding years. Appendicitis also appears to have declined considerably since 1929. The rate has remained stationary, however, for other digestive diseases as a group. For the rheumatic diseases a somewhat lower frequency was recorded than in the same period of the earlier years. The neurasthenia rate fell in the April 1 to July 1 period of this year, but for other diseases of the nervous system no decrease occurred. Again, as in previous reports, one may note that the incidence of diseases of the heart and arteries and nephritis as a group remains at about the same level as in 1929. In contrast with the so-called "degenerative" diseases, a marked downward trend in incidence is revealed for diseases of the skin. The epidemic and endemic diseases against which public health effort has been so largely directed fell to the exceptionally low figure of 2.3 cases annually per 1,000 men during the second quarter of this year.

TABLE 1.—*Frequency of disability lasting 8 calendar days or longer in the second quarter of 1933 compared with the same quarter of 4 preceding years. (Male morbidity experience of 32 industrial companies which have reported their cases to the United States Public Health Service)* [1]

Diseases and disease groups which caused disability. (Numbers in parentheses are disease-title numbers from the International List of the Causes of Death, Fourth Revision, Paris, 1929)	Annual number of disabilities per 1,000 men in second quarter of—				
	1933	1932	1931	1930	1929
Sickness and nonindustrial injuries [2]	70.5	93.1	89.6	96.1	104.4
Nonindustrial injuries	8.9	12.5	12.2	11.8	11.7
Sickness [2]	61.6	80.6	77.4	84.3	92.7
Respiratory diseases	18.3	27.9	26.7	32.1	35.6
Influenza and grippe (11)	6.4	12.8	10 6	12.3	12.2
Bronchitis, acute and chronic (106)	2.3	3.2	3.0	4.1	4.8
Pneumonia, all forms (107-109)	1.6	1.8	2.1	2.4	3.2
Diseases of the pharynx and tonsils (115a)	3.5	5.3	6.1	7.0	8.6
Tuberculosis of the respiratory system (23)	1.2	.8	1.2	1.7	1.4
Other respiratory diseases (104, 105, 110-114)	3.3	4.0	3.7	4.6	5.4

[1] In 1932 and 1933 the same companies are included. The rates for 1931 and 1930 cover 29 and 27 companies, respectively, instead of 32 as in 1932 and 1933.
[2] Exclusive of disability from venereal diseases.

TABLE 1.—*Frequency of disability lasting 8 calendar days or longer in the second quarter of 1933 compared with the same quarter of 4 preceding years. (Male morbidity experience of 32 industrial companies which have reported their cases to the United States Public Health Service)*—Continued

Diseases and disease groups which caused disability. (Numbers in parentheses are disease-title numbers from the International List of the Causes of Death, Fourth Revision, Paris, 1929)	Annual number of disabilities per 1,000 men in second quarter of—				
	1933	1932	1931	1930	1929
Nonrespiratory diseases	43.3	52.7	50.7	52.2	57.1
Diseases of the stomach, cancer excepted (117, 118)	3.1	4.4	3.8	4.6	5.2
Diarrhea and enteritis (120)	1.2	.8	.9	1.3	1.4
Appendicitis (121)	3.2	4.1	3.5	4.9	5.3
Hernia (122a)	1.3	1.5	2.0	1.4	2.2
Other digestive diseases (115b, 116, 122b-129)	3.3	3.0	3.1	3.0	3.3
Rheumatic group, total	10.4	12.8	10.9	11.7	12.4
Rheumatism, acute and chronic (56-57)	5.8	6.6	6.1	6.1	6.6
Diseases of organs of locomotion (156b)	2.4	3.4	3.3	3.6	3.5
Neuralgia, neuritis, sciatica (87a)	2.2	2.8	1.5	2.0	2.3
Neurasthenia and the like (part of 87b)	.9	1.4	1.8	1.3	1.5
Other diseases of the nervous system (78-85, part of 87b)	1.5	1.3	1.6	.9	1.1
Diseases of heart and arteries and nephritis (90-99, 102, 130-132)	4.2	5.1	4.2	3.8	4.2
Other genito-urinary diseases (133-138)	2.1	2.5	2.5	2.4	2.3
Diseases of the skin (151-153)	2.0	2.8	3.3	3.9	4.4
Epidemic and endemic diseases, except influenza (1-10, 12-18, 33, 37, 38, part of 39 and 44)	2.3	3.0	2.7	3.4	3.1
Ill-defined and unknown causes (200)	1.9	1.6	1.9	2.1	2.3
All other diseases (19-22, 24-32, 36, part of 39 and 44, 40-43, 45-55, 58-77, 88, 89, 100, 101, 103, 154-156a, 157, 162)	5.9	8.4	8.5	7.5	8.4
Average number of males covered in the record	120,282	138,799	153,580	165,791	164,108
Number of companies included	32	32	29	27	23

From these data it appears that the health of approximately 120,000 men in industry during the April 1 to July 1 period of 1933 was unusually favorable. If this sample of the industrial population is representative of the experience of larger numbers of industrial workers, the spring months were characterized by unusual freedom from disabling sickness. In general, these morbidity findings correspond with the mortality experience for the first half of 1933. The Metropolitan Life Insurance Co. reports that the health record of American and Canadian wage earners and their families, as judged by mortality rates, during the first half of 1933 has seldom been excelled during the like part of any past year.[2]

As pointed out in previous communications, the sickness rates presented above apply to men employed either on a full or on a part-time basis, but not to men who have been unemployed for any appreciable period. Identical companies reported in 1932 and 1933, and in the 3 years preceding 1932 the reporting units were almost the same. One of the larger companies employs men in all parts of the country, but a preponderance of reports comes from the area located north of the Ohio and Potomac Rivers and east of the Mississippi.

[2] Stat. Bull. Metropolitan Life Ins. Co., vol. XIV, July 1933, no. 7, p. 5.

COURT DECISIONS RELATING TO PUBLIC HEALTH

Statute relating to sale of unwholesome food construed.—(Ohio Court of Appeals; *Mills Restaurant Co.* v. *Clark*, 185 N. E. 470; decided Feb. 3, 1933.) An action was brought against a restaurant company to recover damages for illness alleged to have been caused by food purchased and eaten at the defendant's restaurant. The plaintiff pleaded that the defendant was negligent in three respects: (1) In serving unwholesome food unfit for consumption, in violation of section 12760, General Code; (2) in failing to discover that said food was unwholesome before serving the same; and (3) in failing to inspect said food before service. Judgment in the trial court went for plaintiff, and the defendant appealed.

Section 12760 of the code provided that "Whoever sells, offers for sale, or has in his possession with intent to sell, diseased, corrupted, adulterated, or unwholesome provisions without making the condition thereof known to the buyer shall be fined" etc. Regarding the construction of this statute, the court of appeals said:

> The term "unwholesome" is sometimes used as an equivalent for unhealthful. It cannot be given so broad an interpretation in the section quoted. The associated words and sound reason require that it be construed to apply only to foods that have an added or acquired character of an unwholesome nature; that have become unwholesome to people generally, not to a particular individual, and to people under normal and not under abnormal conditions. * * *
>
> For the plaintiff to make a case under the statute, she was required to prove something more than that she bought and ate the salmon and following that became ill. It is not sufficient if she go even further and show that her illness was due to the salad. She must also show that the salmon was unwholesome in the sense that it was not in its natural state but had become so tainted that normal persons generally, in a normal condition, would have been adversely affected by its use. * * *

The court held that the evidence in the case did not meet these requirements nor tend to do so. "It failed fundamentally", said the court, "in not showing that the food was unwholesome as above defined."

The judgment of the lower court was reversed.

Liability for nuisance resulting from impounding of waters.—(Georgia Court of Appeals, Div. No. 2; *Georgia Power Co.* v. *Fincher*, 168 S. E. 109; decided Mar. 1, 1933.) In a syllabus opinion rendered by the court of appeals in a suit brought against an electric company to recover damages because of an alleged nuisance, there was contained, among other things, the following:

> The lawful power to construct a dam and impound water does not carry with it the power to create a nuisance by the maintenance of foul and ill-smelling water and a breeding place for mosquitoes, etc., to the damage of persons living in the neighborhood; and liability to a person damaged as a result of the nuisance is not dependent upon the existence of negligence upon the part of the person in performing the act which constitutes the nuisance. * * *

PUBLIC HEALTH SERVICE PUBLICATIONS

A List of Publications Issued During the Period January–June, 1933

There is printed herewith a list of publications of the United States Public Health Service issued during the period January-June 1933.

The most important articles that appear each week in the PUBLIC HEALTH REPORTS are reprinted in pamphlet form, making possible a wider and more economical distribution of information that is of especial value and interest to public-health workers and the general public.

All of the publications listed below except those marked with an asterisk (*) are available for free distribution and as long as the supply lasts may be obtained by addressing the Surgeon General, United States Public Health Service, Washington, D.C. Those publications marked with an asterisk are not available for free distribution but may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D.C., *at the prices noted.* (No remittances should be sent to the Public Health Service.)

Periodicals

Public Health Reports (weekly), July–December, vol. 48, nos. 1–26, pages 1 to 786. Venereal Disease Information (monthly), January–June, vol. IX, nos. 1–6, pages 1 to 139.

Reprints from the Public Health Reports

1559. Trends of health in the United States. By Rollo H. Britten. January 13, 1933. 15 pages.
1560. The quantitative determination of quartz ("free silica") in dusts. By Adolph Knopf. February 24, 1933. 8 pages.

*1561. Seasonal variation of average growth in weight of elementary school children. By Carroll E. Palmer. March 3, 1933. 23 pages. 5 cents.

*1562. The objectives in public health nursing and minimum qualifications for those appointed to positions in public-health nursing. March 10, 1933. 8 pages. 5 cents.

*1563. Causes of illness in 9,000 families based on nation-wide periodic canvasses, 1928–31. By Selwyn D. Collins. March 24, 1933. 26 pages. 5 cents.

1564. Production of a malignant growth in a guinea pig. By T. J. Glover and J. L. Engle. March 31, 1933. 4 pages.

*1565. Experimental studies of water purification. VI. General summary and conclusions. By H. W. Streeter. April 14, 1933. 24 pages. 5 cents.

1566. Inactivation of antistreptococcus bacteriophage by animal fluids. By Alice C. Evans. April 21, 1933. 16 pages.
1567. The prevention of Rocky Mountain spotted fever. May 5, 1933. 3 pages.
1568. Mortality in certain States during 1932, with comparative data for recent years. May 5, 1933. 9 pages.
1569. Protective value of convalescent sera of Sao Paulo exanthematic typhus against virus of Rocky Mountain spotted fever. By R. R. Parker and Gordon E. Davis. May 12, 1933. 7 pages.

1570. Rocky Mountain spotted fever and boutonneuse fever. A study of their immunological relationship. By L. F. Badger. May 12, 1933. 4 pages.
1571. Relationship between Rocky Mountain spotted fever and "exanthematic typhus of Sao Paulo." By R. E. Dyer. May 19, 1933. 2 pages.
1572. Maternal, fetal, and neonatal mortality among 1,815 hospitalized American Indians. By E. Blanche Sterling. May 19, 1933. 14 pages.
1573. Rat harborage and its relation to the spread of bubonic plague. By B. E. Holsendorf. May 19, 1933. 4 pages.
1574. Preparation of a scarlet fever streptococcus toxoid and its use in active immunization. By M. V. Veldee, May 26, 1933. 17 pages.
1575. Observations on heart disease in marine hospital practice. A study of organic heart disease in the United States Marine Hospital, Stapleton, N.Y., during the fiscal year 1931. By O. F. Hedley. May 26, 1933. 11 pages.
1576. Heterologous experience (immunization) as a factor in resistance to disease. By Charles Armstrong and W. T. Harrison. June 2, 1933. 13 pages.
1577. Malaria in the irrigated regions of New Mexico. By M. A. Barber and Louis R. Forbrich. June 2, 1933. 14 pages.
1578. Public Health Service publications. A list of publications issued during the period July–December 1932. June 2, 1933. 3 pages.
1579. The Shwartzman phenomenon: factors complicating its use in the testing of antimeningococcic serum. By Anna M. Pabst and Sara E. Branham. June 9, 1933. 13 pages.
1580. Experimental studies of natural purification in polluted waters. VII. The selection of a dilution water for bacteriological examinations. By C. T. Butterfield. June 16, 1933. 11 pages.
1581. Distribution of mottled enamel in the United States. By H. Trendley Dean. June 23, 1933. 32 pages.
1582. The pellagra-preventive value of green cabbage, collards, mustard greens, and kale. By G. A. Wheeler and D. J. Hunt. June 30, 1933. 5 pages.

Supplements to the Public Health Reports

99. Citations to public health laws and regulations, 1929–30. 1933. 30 pages.
100. Laws and regulations relating to morbidity reporting. Prepared by William Fowler. 1933. 29 pages.

Public Health Bulletin

*204. A study of the pollution and natural purification of the Ohio River. IV. A resurvey of the Ohio River between Cincinnati, Ohio, and Louisville, Ky., including a discussion of the effects of canalization and changes in sanitary conditions since 1914–16. By H. R. Crohurst. May 1933. 111 pages. 10 cents.

National Institute of Health Bulletin

*161. I. The pathology of psittacosis in man. II. The pathology of psittacosis in animals and the distribution of Rickettsia psittaci in the tissues of man and animals. By R. D. Lillie. May 1933. 66 pages; 4 plates. 10 cents.

Unnumbered Publications

*Index to Public Health Reports, vol. 47, part 2 (July-December 1932). 23 pages. 5 cents.

*National Negro Health Week program. This pamphlet is published annually, usually about the middle of March, for community leaders in an effort to suggest ways and means by which interested individuals and organizations may be organized for a concerted and effective attack upon the community's disease problems. Nineteenth annual observance. 1933. 12 pages. Out of print.

*National Negro Health Week poster. Nineteenth annual observance. Out of print.

DEATHS DURING WEEK ENDED SEPTEMBER 9, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Sept. 9, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	6,707	6,335
Deaths per 1,000 population, annual basis	9.4	9.0
Deaths under 1 year of age	469	575
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	39	47
Deaths per 1,000 population, annual basis, first 36 weeks of year	11.0	11.3
Data from industrial insurance companies:		
Policies in force	67,848,526	70,787,013
Number of death claims	8,537	9,657
Death claims per 1,000 policies in force, annual rate	6.6	7.1
Death claims per 1,000 policies, first 36 weeks of year, annual rate	9.9	9.7

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended September 16, 1933, and September 17, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 16, 1933, and Sept. 17, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Sept. 16, 1933	Week ended Sept. 17, 1932	Week ended Sept. 16, 1933	Week ended Sept. 17, 1932	Week ended Sept. 16, 1933	Week ended Sept. 17, 1932	Week ended Sept. 16, 1933	Week ended Sept. 17, 1932
New England States:								
Maine		1	3	3		1	0	1
New Hampshire		1			1		0	0
Vermont		1			5	15	0	0
Massachusetts	18	21		3	20	25	1	2
Rhode Island	1	1				3	0	0
Connecticut	3	6	1	3	4	11	0	0
Middle Atlantic States:								
New York	34	28	[1] 5	[1] 8	47	70	1	4
New Jersey [3]	14	16	7	2	13	26	1	3
Pennsylvania	26	42			24	29	2	8
East North Central States:								
Ohio	31	39	47	11	7	15	0	1
Indiana	19	55	17	7	2	4	2	1
Illinois	10	50	3	3	21	9	3	1
Michigan	9	25	5	1	11	76	2	1
Wisconsin	1	11	20	22	12	6	2	0
West North Central States:								
Minnesota	8	14	3	1	7	10	0	1
Iowa [2]	19	5				1	0	0
Missouri	20	38	6		10	3	0	1
North Dakota	4	1	1		5		0	0
South Dakota					1		0	0
Nebraska	4	7		13	4	3	1	0
Kansas	13	22	4		9	11	0	0
South Atlantic States:								
Delaware	3					1	1	0
Maryland [2]	13	7	9	1	3	1	0	1
District of Columbia	10	1			2	2	0	0
Virginia [3]	59	32			6	13	2	0
West Virginia	22	16	4			5	0	1
North Carolina [3]	69	50	21	4	32	28	3	2
South Carolina	29	17	98	143	12	4	0	0
Georgia [3]	47	32		21	17	1	3	0
Florida [3]	5	21	1	8		2	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 16, 1933, and Sept. 17, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Sept. 16, 1933	Week ended Sept. 17, 1932	Week ended Sept. 16, 1933	Week ended Sept. 17, 1932	Week ended Sept. 16, 1933	Week ended Sept. 17, 1932	Week ended Sept. 16, 1933	Week ended Sept. 17, 1932
East South Central States:								
Kentucky	49	60	-------	-------	-------	4	1	0
Tennessee	56	104	9	27	9	5	1	3
Alabama [3]	57	87	21	2	2	-------	0	2
Mississippi [2]	14	37	-------	-------	-------	-------	0	0
West South Central States:								
Arkansas	10	20	-------	16	6	3	0	0
Louisiana	22	22	1	1	2	7	0	2
Oklahoma [4]	24	52	14	28	3	2	1	0
Texas [3]	126	14	160	10	19	-------	1	0
Mountain States:								
Montana [5]	10	1	3	1	1	21	0	0
Idaho	-------	5	1	-------	-------	-------	0	0
Wyoming [5]	-------	-------	-------	-------	3	4	0	0
Colorado	5	4	-------	-------	1	1	0	1
New Mexico	-------	10	-------	-------	-------	-------	0	0
Arizona	2	2	-------	13	6	-------	0	0
Utah [2]	-------	-------	2	-------	4	-------	0	1
Pacific States:								
Washington	2	-------	-------	-------	11	6	1	0
Oregon	1	-------	13	7	8	15	0	0
California	24	42	23	149	74	24	1	2
Total	902	1,020	502	508	424	467	30	39

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Sept. 16, 1933	Week ended Sept. 17, 1932	Week ended Sept. 16, 1933	Week ended Sept. 17, 1932	Week ended Sept. 16, 1933	Week ended Sept. 17, 1932	Week ended Sept. 16, 1933	Week ended Sept. 17, 1932
New England States:								
Maine	0	1	0	2	0	0	3	6
New Hampshire	1	0	7	0	0	0	0	0
Vermont	1	1	5	8	0	0	0	0
Massachusetts	21	4	63	95	0	0	7	6
Rhode Island	1	1	12	6	0	0	0	0
Connecticut	9	0	13	22	0	0	2	2
Middle Atlantic States:								
New York	133	20	111	98	0	0	43	63
New Jersey [2]	31	40	40	34	0	0	8	19
Pennsylvania	35	145	125	132	0	0	39	86
East North Central States:								
Ohio	48	4	109	168	0	1	74	70
Indiana	1	0	48	43	0	1	11	19
Illinois	21	7	107	133	0	0	23	39
Michigan	4	10	66	59	1	0	16	22
Wisconsin	4	3	18	23	4	0	3	2
West North Central States:								
Minnesota	28	8	15	21	2	0	1	6
Iowa [2]	4	1	36	13	0	0	11	15
Missouri	2	0	43	35	0	0	22	19
North Dakota	4	1	6	2	1	0	0	3
South Dakota	0	0	11	3	0	0	3	1
Nebraska	1	6	11	14	0	0	3	0
Kansas	2	2	43	42	1	0	16	14
South Atlantic States:								
Delaware	0	2	4	3	0	0	1	0
Maryland [2]	2	7	31	19	0	0	21	47
District of Columbia	0	0	2	3	0	0	3	1
Virginia [3]	1	1	63	35	0	0	37	39
West Virginia	8	5	27	30	0	0	35	53
North Carolina [3]	2	2	67	40	0	0	16	26
South Carolina	0	2	4	4	0	0	45	31
Georgia [3]	0	0	18	14	0	0	21	35
Florida [3]	0	0	1	6	0	0	1	4

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 16, 1933, and Sept. 17, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Sept. 16, 1933	Week ended Sept. 17, 1932	Week ended Sept. 16, 1933	Week ended Sept. 17, 1932	Week ended Sept. 16, 1933	Week ended Sept. 17, 1932	Week ended Sept. 16, 1933	Week ended Sept. 17, 1932
East South Central States:								
Kentucky	5	0	85	60	1	1	51	58
Tennessee	3	1	49	47	0	0	50	95
Alabama [3]	1	0	33	43	0	1	7	19
Mississippi [2]	0	0	9	26	0	0	5	15
West South Central States:								
Arkansas	0	0	2	9	1	1	14	20
Louisiana	1	2	3	14	0	0	23	22
Oklahoma [4]	3	3	7	23	1	0	26	22
Texas [3]	1	1	37	10	10	0	70	23
Mountain States:								
Montana [5]	1	0	12	11	0	0	13	6
Idaho	0	0	3	0	2	1	0	0
Wyoming [5]	0	0	6	5	0	0	0	3
Colorado	0	0	7	47	0	0	13	2
New Mexico	0	1	10	10	0	0	20	9
Arizona	0	0	3	3	0	0	4	5
Utah [2]	1	0	3	1	0	0	2	0
Pacific States:								
Washington	11	1	12	23	4	1	4	5
Oregon	2	1	10	5	0	1	5	1
California	4	3	84	68	9	7	7	5
Total	397	286	1,481	1,512	37	15	779	938

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Sept. 16, 1933, 47 cases, as follows: Virginia, 1; North Carolina, 1; Georgia, 19; Florida, 1; Alabama, 16; Texas, 9.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Rocky Mountain spotted fever, week ended Sept. 16, 1933, 2 cases, as follows: Montana, 1; Wyoming, 1.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
August 1933										
Arizona	1	11	11	1	29	1	0	19	1	35
California	10	135	63	9	382	5	15	268	43	47
Indiana	10	41	108	8	30	--------	4	82	0	94
Iowa	2	30	--------	--------	--------	--------	8	47	3	17
Michigan	3	81	5	6	89	--------	16	255	--------	93
Minnesota	5	46	4	1	120	--------	83	64	1	12
Missouri	7	48	8	49	41	--------	11	76	1	113
Nebraska	1	10	--------	--------	9	--------	2	24	0	3
New Jersey	4	32	5	1	90	--------	58	94	0	28
New York	26	101	--------	7	482	--------	540	325	0	223
North Carolina	2	138	9	--------	101	62	2	184	0	98
Ohio	4	75	57	20	56	--------	84	419	8	248
Pennsylvania	17	149	--------	3	435	2	113	459	0	196
Rhode Island	1	7	--------	--------	7	--------	9	37	0	2
Tennessee	6	50	35	582	84	27	33	104	0	811
Wyoming	--------	1	2	--------	14	--------	2	15	0	10

August 1933

	Cases
Anthrax:	
Arizona	1
Michigan	1
Minnesota	1
Chicken pox:	
Arizona	4
California	324
Indiana	5
Iowa	10
Michigan	60
Minnesota	33
Missouri	11
Nebraska	8
New Jersey	97
New York	328
North Carolina	17
Ohio	69
Pennsylvania	228
Rhode Island	8
Tennessee	4
Wyoming	2
Diarrhea and enteritis:	
Ohio	35
Dysentery:	
Arizona	20
California (amebic)	9
California (bacillary)	24
Michigan	4
Minnesota (amebic)	2
Minnesota	1
Missouri	19
New Jersey	4
New York	35
Ohio	2
Pennsylvania	2
Tennessee	52
Food poisoning:	
California	34
Ohio	16
German measles:	
Arizona	3
California	31
Iowa	1
New Jersey	16
New York	39
North Carolina	7
Ohio	9
Pennsylvania	15
Tennessee	2
Granuloma, coccidioidal:	
California	8
Hookworm disease:	
California	1
Impetigo contagiosa:	
Arizona	12
Iowa	3
Tennessee	10
Lead poisoning:	
Ohio	10
Leprosy:	
California	2
Michigan	1
Lethargic encephalitis:	
California	4
Indiana	1
Iowa	4
Michigan	10
Minnesota	6
Missouri	365
Nebraska	3
New Jersey	5
New York	19

[1] Exclusive of New York City.

August 1933—Continued

	Cases
Lethargic encephalitis—Continued.	
Ohio	11
Pennsylvania	2
Rhode Island	1
Mumps:	
Arizona	16
California	441
Indiana	3
Iowa	18
Michigan	69
Missouri	21
Nebraska	4
New Jersey	71
Ohio	23
Pennsylvania	189
Rhode Island	4
Tennessee	19
Ophthalmia neonatorum:	
Iowa	3
Minnesota	2
New Jersey	2
New York	3
Ohio	92
Pennsylvania	13
Tennessee	1
Paratyphoid fever:	
California	4
Indiana	4
Michigan	5
New Jersey	1
New York	12
North Carolina	3
Ohio	1
Rhode Island	1
Tennessee	14
Plague (bubonic):	
California	1
Psittacosis:	
California	2
Puerperal septicemia:	
Ohio	3
Pennsylvania	7
Tennessee	3
Rabies in animals:	
California	66
Indiana	29
Missouri	10
New Jersey	17
Rabies in man:	
Ohio	1
Relapsing fever:	
California	1
Rocky Mountain spotted fever:	
California	1
New York	2
North Carolina	11
Tennessee	2
Wyoming	4
Septic sore throat:	
Arizona	1
California	5
Michigan	21
Minnesota	1
Missouri	4
New York	38
North Carolina	4
Ohio	100
Rhode Island	1
Tennessee	10
Wyoming	3

August 1933—Continued

	Cases
Tetanus:	
California	20
Michigan	1
New Jersey	1
New York	11
Ohio	2
Pennsylvania	8
Wyoming	1
Trachoma:	
Arizona	28
California	11
Michigan	1
Minnesota	2
Ohio	6
Pennsylvania	5
Tennessee	42
Trichinosis:	
California	1
New York	2
Pennsylvania	1
Tularaemia:	
California	4
Iowa	1
North Carolina	1
Ohio	1
Tennessee	1
Wyoming	3
Typhus fever:	
New York	1
North Carolina	9
Tennessee	1
Undulant fever:	
Arizona	2
California	18
Indiana	1
Iowa	15
Michigan	7
Minnesota	10
Missouri	1
New Jersey	2
New York	24
North Carolina	1
Ohio	9
Pennsylvania	7
Vincent's angina:	
Iowa	1
Michigan	10
New York	[1] 78
Tennessee	6
Wyoming	1
Whooping cough:	
Arizona	37
California	1,107
Indiana	102
Iowa	126
Michigan	992
Minnesota	221
Missouri	126
Nebraska	93
New Jersey	493
New York	1,725
North Carolina	497
Ohio	770
Pennsylvania	1,223
Rhode Island	183
Tennessee	109
Wyoming	22

WEEKLY REPORTS FROM CITIES

City reports for week ended Sept. 9, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Colorado:											
Denver	0		0	1	6	0	0	3	1	25	76
Pueblo	0		0	0	1	0	0	0	2	2	2
New Mexico:											
Albuquerque	1		0	0	0	0	0	3	0	0	15
Utah:											
Salt Lake City	0		0	1	1	0	0	0	1	15	22
Nevada:											
Reno	0		0	0	1	0	0	0	0	0	1
Washington:											
Seattle	4		0	0	3	4	0	3	0	13	70
Spokane	0		0	5	0	1	0	1	0	0	31
Tacoma											
Oregon:											
Portland	0		0	1	2	3	1	0	1	0	60
Salem	0		0	0	0	0	0	0	0	0	0
California:											
Los Angeles	16	1	0	6	3	15	1	18	1	41	218
Sacramento	0		0	0	0	1	0	2	0	1	13
San Francisco	0		1	2	4	12	0	4	0	18	120

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Vermont:			
Burlington	0	0	1
Massachusetts:			
Boston	0	0	12
Springfield	0	0	1
Connecticut:			
Bridgeport	1	0	3
New York:			
New York	1	3	74
Rochester	1	1	1
Syracuse	0	0	4
New Jersey:			
Newark	0	0	6
Pennsylvania:			
Philadelphia	3	0	1
Pittsburgh	0	0	5
Reading	0	0	1
Ohio:			
Cincinnati	0	0	1
Cleveland	0	0	7
Indiana:			
Indianapolis	3	2	0
Illinois:			
Chicago	4	1	5
Michigan:			
Detroit	0	0	1
Minnesota:			
Duluth	0	0	3
Minneapolis	0	0	6
St. Paul	0	0	4
Iowa:			
Des Moines	0	0	1
Missouri:			
St. Louis	0	0	3
North Dakota:			
Fargo	0	0	2
District of Columbia:			
Washington	0	0	1
West Virginia:			
Charleston	0	0	1
Georgia:			
Atlanta	1	1	0
Tennessee:			
Nashville	0	0	2
Alabama:			
Birmingham	0	0	1
Texas:			
Dallas	0	0	1
Colorado:			
Denver	1	0	0
Washington:			
Seattle	0	0	5
Oregon:			
Portland	0	1	0
California:			
Los Angeles	2	0	1
San Francisco	0	1	0

Lethargic encephalitis.—Cases: Bridgeport, Conn., 1; Buffalo, 1; New York, 8; Philadelphia, 4; Cleveland, 3; Toledo, 1; South Bend, Ind., 1; Springfield, Ill., 3; Detroit, 9; Flint, Mich., 1; Grand Rapids, 3; Kenosha, Wis., 1; Minneapolis, 1; St. Paul, 1; St. Louis, 159; Fargo, N.Dak., 1; Omaha, 1; Washington, 1; Charleston, S.C., 1; Salt Lake City, 2; San Francisco, 1.

Pellagra.—Cases: Winston-Salem, N.C., 1; Atlanta, 2; Savannah, 1; Miami, 1; Memphis, 1; Birmingham, 1; New Orleans, 2; Dallas, Tex., 1.

Typhus fever.—Cases: Charleston, S.C., 1; Savannah, 1; Birmingham, 1; Mobile, 2; Montgomery, 1; San Antonio, 1.

FOREIGN AND INSULAR

CANADA

Quebec Province—Communicable diseases—Two weeks ended September 9, 1933.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended September 9, 1933, as follows:

Disease	Cases	Disease	Cases
Chicken pox	19	Ophthalmia neonatorum	1
Diphtheria	29	Poliomyelitis	19
Dysentery	6	Scarlet fever	45
Erysipelas	7	Tuberculosis	141
German measles	3	Typhoid fever	85
Influenza	1	Undulant fever	1
Measles	69	Whooping cough	147

PUERTO RICO

Notifiable diseases—Four weeks ended September 9, 1933.—During the 4 weeks ended September 9, 1933, cases of certain notifiable diseases were reported in the municipalities of Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chicken pox	3	Paratyphoid fever	1
Diphtheria	57	Pellagra	1
Dysentery	209	Puerperal fever	1
Erysipelas	6	Ringworm	11
Filariasis	4	Syphilis	14
Framboesia	1	Tetanus	3
Influenza	37	Tetanus (infantile)	4
Leprosy	1	Trachoma	1
Malaria	3,318	Tuberculosis	440
Measles	56	Typhoid fever	34
Mumps	24	Whooping cough	110
Ophthalmia neonatorum	8		

YUGOSLAVIA

Communicable diseases—July 1933.—During the month of July 1933, certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	71	7	Poliomyelitis	3	2
Cerebrospinal meningitis	13	8	Scarlet fever	170	8
Diphtheria and croup	427	40	Sepsis		3
Dysentery	68	1	Tetanus	56	20
Erysipelas	172	2	Typhoid fever	252	24
Measles	235	1	Typhus fever	89	5
Paratyphoid fever	21	1			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Feb. 5–Mar. 4, 1933	Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Apr. 30–May 27, 1933	Week ended— June 1933: 3	June 10	June 17	June 24	July 1933: 1	July 8	July 15	July 22	July 29	August 1933: 5	Aug. 12	Aug. 19	Aug. 26	Sept. 2, 1933
China:																			
Canton	C											1							
Hankow	C				2			1						2					
	D				1									1	1				
Swatow	C				2														
Tientsin	C									2	2								
India	C	3,171	7,878	11,095	8,201	1,155	729	785	848	900	1,254	1,632							
	D	5,170	3,352	5,655	4,091	463	331	362	399	441	557	715							
Bombay	C	1		1	2				1	1	1	2	1	1				1	
Calcutta	C	114	327	770	690	78	60	22	36	14	24	14	7	18	16	12	18	13	
Chittagong	C	1	5	16	21	1		4	2								1		
Colong	C			1															
Moulmein	C						2	*	1										
Rangoon	C			1	1				1			2							
Vizagapatam	C				1									4					
India, French: Chandernagor	C	2																	
Indo-China (see also table below):																			
Pnom-Penh	C		1		2	1													
Saigon and Cholon	C		1	4						3	3	1	1		2				
Philippine Islands: [1]																			
Bohol Province	C				15	40	14	13	13										
	D				12	20	9	7	2										
Tagbilaran	C														1				
Cebu Province	C	17	2			1		1											
Cebu	C								1								1		1
	D								1								1		1
Mactan Island	C															1			
Olango Island	C															6	3		
	D															3	3		
Opon	C										6	29	37	8	4	1			
	D										2	8	16	6	5	1			
Santa Fe	C									2		4	1			6	2	2	
	D									2		1	2			4	3		

Toledo	C												3						
	D												2						
Iloilo Province—Iloilo	C				1							1							
	D				1							1							
Leyte Province	C	78	26	50	22		2										2		
	D	56	24	46	20		2										2		
Occidental Negros Province	C								19										
	D								9										
San Carlos	C									5	1						1		
	D									6	1						1		
Pampanga Province	C				1														
	D				1														
Rizal Province	C				1														
Samar Province	C		[2] 186	67	29			3	4										
	D		[2] 144	50	23			3	2										
Calbayog	C																6	5	
	D																6	4	
Santa Margarita	C																10	10	
	D																5	5	
Siam:																			
Bangkok	C				1		1												
Provinces	C			1	13	5	11	7	5		1								
	D				6	1	7	2	4		1								
On vessels:																			
S.S. Dunana at Madras	D				1														
S.S. Lauterfels at Calcutta	C				1														
S.S. Mathura at Calcutta	C				1														

Place		February 1933			March 1933			April 1933			May 1933			June 1933			July 1933		
		1-10	11-20	21-28	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31
Indo-China (French) (see also table above):																			
Cambodia [3]	C	9		1		2	2	5		4	11	14	17	23	31	14	3	1	
	D	6				1	2	5		2	8	10	9	12	17	6	3	1	
Cochin-China [3]	C	9	2	1	8	4	2	2	7	1	5	9	6	4	8	5	6	2	12
	D	6	2	1	7	3	2	2	7	1	4	8	6	4	8	4	5	2	3

[1] During the week ended Sept. 16, 1933, cholera was reported in the Philippine Islands as follows: Cebu Province, Cebu city, 1 case, 1 death; Olango Island, 4 cases, 3 deaths; Opon, 1 case.

[2] For the month of March 1933.

[3] Reports incomplete.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE[1]

[C indicates cases; D, deaths; P, present]

Place		Feb. 5–Mar. 4, 1933	Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Apr. 30–May 27, 1933	Week ended— June 1933: 3	June 10	June 17	June 24	July 1933: 1	July 8	July 15	July 22	July 29	August 1933: 5	Aug. 12	Aug. 19	Aug. 26
Angola	C	P																
Argentina:[2]																		
Cordoba Province	C	5	5	1	8													
Jujuy Province	C	6																
Rosario	C		2															
San Luis Province	C			7														
Azores[3]																		
Belgian Congo	C			P														
Bolivia: Tomina Province	C	P		P														
British East Africa (see also table below):																		
Kenya	C						3			2	2	2	1		2		1	
Tanganyika	D		1		1													
Uganda	C	40	44	48	85	17	23		13	14	9	12	15	8				
	D	40	44	48	83	16	24		13	14	9	12	15	8				
Ceylon:																		
Colombo	C	10	2	1				1		1	1							
	D	7	2					1		1	1							
Plague-infected rats		4								2	1	1			1			
Provinces	C	1	28															
	D	1	26															
Dutch East Indies:																		
Batavia	C		[4] 1															
West Java	C	1,040	966	949	878	255		274	264	224								
	D	1,036	953	948	872	253		272	264	220								
Ecuador. (See table below.)																		
Egypt:																		
Alexandria	C		1	1									2	2	1			
Asyut	C	4	8	11	10	1		1										
Aswan	C			3	1													
Faiyum	C							1	1	3			1					
	D												1					
Girga	C									1	1							
Minufiya	C		2	1	1													
Minya	C								4		1							
Qena	C																1	
	D																1	

Luxor	C															1		
France: Marseille	C															8		
	D															3		
Hawaii Territory.[5]																		
India	C	6,399	5,409	3,227	2,319	423	271	280	437	240	502	870						
	D	3,775	3,498	2,042	1,407	290	202	154	585	385	267	531						
Bassein	C	2	12	13	3	1				1	2	3	2	3	1	4		2
Palgue-infected rats		2	1	1	3	2				1		1				1		
Bombay	C	3	15	10	6	1		1					1			1		
Plague-infected rats		68	121	103	34	3	5	4	4	3	1			1	2	2		1
Madras Presidency	C	378		27	23	8												
	D	173		14	8	6												
Rangoon	C	2			1				1									
Plague-infected rats		2	1								3						1	
Indo-China (see also table below):																		
Pnom-Penh	D	1	1	3	6			1	2	1				1		1	1	1
Saigon and Cholon	C			4	2					1	1				2		1	
Plague-infected rats					3													
Iraq:																		
Baghdad	C	3			3	1			1	3	[4] 1	[4] 1	1	1				
Basra	C									3								
Madagascar. (See table below.)																		
Morocco	C	4	33	28	2					5	2	1						
Peru. (See table below.)																		
Senegal. (See table below.)																		
Siam:																		
Bangkok	C			2														
Provinces	C	16	11				1		1									
South-West Africa.[6]																		
Straits Settlements: Singapore	C			2														
Syria: Beirut	C			1				1				2						
Union of South Africa: Orange Free State	C	1			7													
United States: California:																		
San Benito County—Plague-infected ground squirrels															7		1	
Whittier	C															1		
	D															1		
On vessel: S.S. Kingsborough at port in Argentina	C		1															

[1] Including plague in the United States and its possessions.
[2] For the month of July 1933, 7 cases of plague with 3 deaths were reported in El Mollar, Salta Province, Argentina.
[3] Under date of Sept. 19, 1933, plague was reported in the *Azores as follows:* 6 cases with 1 death and 1 suspected case at St. Michael's, and 1 case at Fayal.
[4] Imported.
[5] On Sept. 6, 1933, 1 plague-infected rat was reported in Kalopa Homesteads in Hamakua district, island of Hawaii.
[6] 63 cases of plague with 5 deaths were reported in Ovamboland, South-West Africa from Jan. 1 to June 17, 1933. Antiplague measures have been taken.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		February 1933	March 1933	April 1933	May 1933	June 1933	July 1933
British East Africa (see also table above): Kenya	C	11	6	6	4	6	-
Ecuador	C	-	3	-	35	-	-
Indo-China:							
Cambodia	D	3	7	6	3	5	3
Cochin-China	C	1	2	5	2	-	2
Madagascar:							
Province:							
Ambositra	C	161	155	-	-	-	-
	D	149	154	-	-	-	-
Antsirabe	C	72	63	-	-	-	-
	D	72	62	-	-	-	-
Fianarantsoa	C	46	64	-	-	-	-
	D	42	63	-	-	-	-
Maevatanana	C	6	8	-	-	-	-
	D	5	7	-	-	-	-
Madagascar—Continued							
Province—Continued							
Miarinarivo	C	8	9	-	-	-	-
	D	8	9	-	-	-	-
Moramanga	C	23	48	-	-	-	-
	D	23	46	-	-	-	-
Tamatave	C	-	1	-	-	-	-
	D	-	1	-	-	-	-
Tananarive	C	219	175	-	-	-	-
	D	207	168	-	-	-	-
Peru	C	18	7	2	3	5	6
Senegal:							
Dakar [7]	C	4	1	1	2	-	57
	D	4	-	1	1	-	39
Tivaouane [7]	C	-	-	1	-	1	-

[7] Reports incomplete.

SMALLPOX

Place		Feb. 5–Mar. 4, 1933	Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Apr. 30–May 27, 1933	Week ended— June 1933: 3	10	17	24	July 1933: 1	8	15	22	29	August 1933: 5	12	19	26
Algeria:																		
Algiers Department	C	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
Constantine Department	C	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Arabia:																		
Aden	C	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Muscat—Oman Sultanate	C	-	-	-	-	44	-	29	-	-	-	-	-	-	-	-	-	-
	D	-	-	-	-	11	-	9	-	-	-	-	-	-	-	-	-	-
Argentina: Chaco Territory	C	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Belgian Congo	C										2	3						
	D										1							
Bolivia. (See table below.)																		
Brazil: Porto Alegre (alastrim)	C						2	4				1						
British East Africa:																		
Kenya	C	14	23	13	4													
Tanganyika	C	56	43	17	13	8			2		2		1	3				
British South Africa:																		
Northern Rhodesia	C	1	21		2									1				
Southern Rhodesia	C	22		8	16							1						
Canada:																		
British Columbia	C			[1]6	[1]1	[1]1												
Ontario	C		5		[1]1	[1]1												
Toronto	C			[1]3	1													
Saskatchewan	C	31	14	[1]2	[1]5	[1]1		[1]6										
Ceylon:																		
Colombo	C	34	4	2	4		1	2	6	3	1	1		1		7	1	1
Galle	C			46	2									1				
China:																		
Amoy	C	5	4	3	3	1		1										
Canton	C	234	67	50	7													
	D	1		2														
Chemulpo	C	17																
Dairen	C	5	5	1	3		2					3						
Foochow	C	P	P	P	P		P		P		P							
Hangchow	C										3				1			
	D										2				1			
Hong Kong	C	169	169	84	19	3	2	2	1	1	1	1					1	
Macao	C	8	11	4	4													
Nanking	C	89	16	2	2		1		1	1		1						
Shanghai	C	28	38	39	33	3	6	12	6	3	10	3	3	3	5	3	1	1
Swatow	C	21	26	16	10	3	1											
Tientsin	C					10	3	1	2	1	1							
Chosen. (See table below.)																		
Colombia: Buenaventura	D											1						
Dahomey. (See table below.)																		
Ecuador. (See table below.)																		
Egypt:																		
Alexandria	C	943	277	42	11													
Asyut	C											79	27	6	14		40	
	D											5	8	10	3		4	
Beheira	C	80	132	114	62	4	1	1										
Cairo	C	25	16	10	10	1	2		1	1								
Dakahliya	C											4					1	
Faiyum	C											4	5	35	10	3	3	
Gharbiya	C	48	74	88	93	46	40	26	30	18	16	19	9	21	8	1	27	
Girga	C											2				1		
Minufiya	C	40	35	37	128	15	8	2	1									
Port Said	C	1	6	3														
Qena	C													9	14	4		

[1] For 2 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Feb. 5–Mar. 4, 1933	Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Apr. 30–May 27, 1933	Week ended— June 1933 3	June 10	June 17	June 24	July 1933 1	July 8	July 15	July 22	July 29	August 1933 5	Aug. 12	Aug. 19	Aug. 26
Egypt—Continued																		
Suez	C	4	3															
Provinces	C	211	284	309	347	82	80	56	69	137	122	111	47	82	50	80	89	
France. (See table below.)																		
Great Britain:																		
England and Wales	C	76	71	98	91	27	18	18	8	14	15		4	7	10	5	9	8
London	C	66	62	75	79	17	16	12	6	12	12	9	2	5	9	4	7	8
London and Great Towns	C	75	66	85	82	17	17	15	7	13	13	14	3	6	9	5	9	8
Greece (see also table below): Salonika	C				18						2	2	2	2				
Guatemala. (See table below.)																		
Honduras:																		
Puerto Castilla	C		2															
Tegucigalpa	C		14	1	7	3												
Tela	C	6	2	1														
India	C	31,824	34,938	40,379	33,876	7,015	5,905	6,001	4,710	3,550	3,320	2,882						
	D	8,303	8,391	10,288	9,706	2,065	1,747	1,783	1,413	1,019	957	901						
Bassein	C	7	13	57	32	4	4	6	2		2	4		3	3	4	1	2
	D	2	5	14	11	3	4	4		1	1	4		2	2	4		
Bombay	C	1,522	1,175	510	212	34	18	20	16	14	8	5	2	5	7	3	1	3
	D	795	717	286	148	22	14	12	10	10	4	5	2	4	4	2		2
Calcutta	C	1,637	1,520	921	342	53	35	25	21	20	13	6	7	13	4	6	2	6
	D	1,147	1,053	745	289	45	23	19	20	16	10	3	7	13	3	4	1	
Chittagong	C				1													
	D				1													
Cochin	C		4	5			1		1	1		2		1				
Karachi	C	47	115	130	52	4	10	3	2	3	4	4	3	2	1	3	1	
Madras	C	564	666	496	231	36	29	31	48		61	39	71	72	45	37	79	62
Moulmein	C	1					12											
Negapatam	C	2	4	6	7	1	1	1			4	1	2	5	2	4	3	12
Rangoon	C	20	11	15	17	3	1	2		2		1	1				1	
Tuticorin	C			1											2			
Vizagapatam	C		5	4	2	1	1	1	2	2	4	1	1	6	7		3	1
India (French):																		
Karikal	C					2	1	1	1									
	D					2	1	1	1									

Pondichery	C					19	49	33	28	29	46	31		33	46			
	D					17	29	19	17	18	21	13		21	29			
Indo-China (see also table below): Saigon and Cholon	C	3	7	2									1					
Iraq:																		
Baghdad	C	4	2	2	5													
Basra	C	3	2		6	2												
Ireland: Belfast	C	1																
	D	1																
Japan:																		
Kobe	C		5							1								
Nagoya	C	1																
Osaka	C	3	4	8	1													
Tokyo	C		2	6	1	1		1		27	11	3	4					
Yokohama	C			3														
Mexico:																		
Coahuila	C	1			1	1			1									
Juarez	C	3		5	2													
Mexico, D. F.	C	5	6	11	5		2	3			1							
Monterrey	D				2													1
Saltillo	D	4	3	1	2			2	1									
San Luis Potosi	D			1	5			1		1	2	2	2	2	3	1	3	1
Morocco. (See table below.)																		
Nigeria	C	1,878	562	1,201							33		642					
Palestine	C										9	4						
Persia	C	29	26	54	89	15	16				17		9				12	
	D	4	4	23	62	45	17				6		3				4	
Peru. (See table below.)																		
Poland	C				2				1					1				
Portugal:																		
Lisbon	C	4	2	2	2		1	2		1	2		2				1	2
Oporto	C	5	2		2					1		1		1		1		
Siam: Bangkok	D	2	4															
Sierra Leone	C	36	63	22	51		6				15							
Sudan (Anglo-Egyptian)	C	34	32	18	5	1					1	3	1					
Syria:																		
Beirut	C	15	16	2	1		5	1		1	1	7	3	2	5		16	
Provinces	C	34	25	40	20		1		3	6		3			1	1		9
Turkey. (See table below.)																		
Union of South Africa:																		
Cape Province	C	P	P		P													
Orange Free State	C	P	P	P		P	P											
Zanzibar	C	2																
On vessels:																		
S.S. Volturno at Alexandria	C	1																
S.S. Arimondi at Massaoua	C	2																
S.S. Hatasu at Malta	C		1															
S.S. Talma at Hong Kong	C	1																
S.S. Karapara at Rangoon	C	1																
S.S. California at Liverpool	C		1															
S.S. Kalgan at Bangkok from Swatow	C		1															

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Feb. 5–Mar. 4, 1933	Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Apr. 30–May 27, 1933	Week ended— June 1933: 3	June 10	June 17	June 24	July 1933: 1	July 8	July 15	July 22	July 29	August 1933: 5	Aug. 12	Aug. 19	Aug. 26
On vessels—Continued																		
S.S. Nordland at Alexandria	C		1															
S.S. Hong Kheng at Rangoon	C	1																
S.S. Hiram at Bangkok	C		1															
S.S. Arunda at Rangoon from Calcutta	C		1															
S.S. Haiching at Amoy	C		1															
S.S. City of Nagpur at Karachi	C			1														
S.S. Rajputana at Aden	C				1													
	D				1													
S.S. Baron Inchcape at Hong Kong	C				P													
S.S. Fernmoor at Vancouver	C						4											
S.S. Egra at Rangoon from Calcutta	C				1										1			
S.S. Arracan at Newport	C																	

Place		February 1933	March 1933: 1–10	Mar. 11–20	Mar. 21–31	April 1933: 1–10	Apr. 11–20	Apr. 21–30	May 1933: 1–10	May 11–20	May 21–31	June 1933: 1–10	June 11–20	June 21–30	July 1933: 1–10	July 11–20
Dahomey	C	32						26	2	9		1	1		2	1
	D	2						1		2			1		1	
Indo-China (see also table above)	C	187	167	83	120	107	159	163	58	48	43	60	83	54	74	
	D	77	55	30	45	31	30	50	21	14	10	16	36	24	31	

Place		February 1933	March 1933	April 1933	May 1933	June 1933	July 1933
Bolivia	C	39	21	21	28	12	10
Chosen	C	36	30	4	34		3
	D	5	7	2	14		
Ecuador	C		15		[2] 1		
France	C	20	23	15	21		
Greece	C	3	4	6			
Guatemala	C			3	1		
Morocco	C	14		23	14	10	8
Peru	C	6	7	5	6		
Turkey	C	22	1	3		13	

[2] Imported.

TYPHUS FEVER

Place		Feb. 5–Mar. 4, 1933	Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Week ended— May 1933 6	13	20	27	June 1933 3	10	17	24	July 1933 1	8	15	22	29	August 1933 5	12	19
Algeria:																				
Algiers Department	C	1	3	2	7	2	2	3	4			7	1		1	2	3	1	1	
Constantine Department	C	71	107	219	52	41	16	11	40	34	38	45	18	20	3	14	11	3	8	
Bone	C	1	2	3	1	1											1		1	
Oran Department	C								1				1	1						
Basutoland. (See table below.)																				
Bolivia. (See table below.)																				
British East Africa: Ugana	C	19	12			2	8		2	2	1	2	1	3						
Bulgaria	C	9	48	9	8					4				1		1			2	1
Chile [1]	C	133	102	137																
Antofagasta	C	1		1							1									
Santiago	C		1		34	30	29	41	33	85	74	98	72	141	216	221				
Valparaiso	C											1		1		4	2			
China:																				
Hankow	C	5																		
Nanking	C													1					1	
Shanghai	C													1						
Tientsin	C													1						
Czechoslovakia. (See table below.)																				
Egypt:																				
Alexandria	C			6	6	7	4	7	5	5	4	3	9	2	3	1	3	1		
Beheira	C	174	184	443	163	146	131	120	226	111	138	94	42	108	46	41	20	16	21	14
Cairo	C	3	4	42	14	15	12	12	9	12	7		1	1	3	2	2	2	1	
Dakahliya	C	84	196	231	49	71	86	61	47	24	46	23	43	17	11	5	6	8	10	19
Damietta	C								1		2			1	2					
Gharbiya	C	190	378	331	96	118	105	129	185	132	133	141	97	53	75	56	29	22	10	19
Provinces	C	492	922	1,245	388	446	402	375	568	341	381	301	242	199	161	115	68	54	63	56
Greece. (See table below.)																				
Guatemala. (See table below.)																				
Hungary	C	26	5	14	3	3	4	5	7		2	2								
Iraq: Baghdad	C		1	1		1		1	1		1				1		1		1	
Ireland: Belfast	C	1																		
Lithuania	C	44	35	27	12	7	4	8	1	5	8	1		1					8	
Mexico:																				
Mexico, D.F.	C	11	14	4	4	3	5	3	7	2				2	1	2	1		1	
San Luis Potosi	D		1																	

[1] From the beginning of the year up to Sept. 5, 1933, 2,245 cases of typhus fever with 362 deaths were reported in Santiago, Chile. For the week ended Sept. 2, 1933, Valparaiso, Chile, reported 5 cases of typhus fever.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		Feb. 5–Mar. 4, 1933	Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Week ended— May 1933 6	May 13	May 20	May 27	June 1933 3	June 10	June 17	June 24	July 1933 1	July 8	July 15	July 22	July 29	August 1933 5	Aug. 12	Aug. 19
Morocco	C	138	46	17	6	10	8	7	19	17	19	8		4		8	2	1	11	
Palestine	C	2	3	3								1	18		1		1		2	
Persia	C	40	28	69	24	10	5		7	6	8	4	6		2	8	5	9	4	2
Peru. (See table below.)																				
Poland	C	350	335	355	100	98	98	82	96	76	75	75	61	44	38	20	33	27	19	3
	D	20	20	24	3	8	4	6	2	5	2	4	3	2	2	1	3	4		1
Rumania	C	276	278	238	68	74	61	62	40	36		21		15	11	21				
Syria	C				7	1	11	5	18	2		1	1						1	
Trans-Jordan	C	2	13	8	6	6	1	4	2	2					1	1				
Tunisia:																				
Tunis	C	1	1	1																
Provinces	C	34	48	52	10	3	20	9	12	36	5	12		20	6	10				
Turkey (see also table below): Istanbul	C	1	4	1																
Union of Socialist Soviet Republics. (See table below.)																				
Union of South Africa. (See table below.)																				
Yugoslavia. (See table below.)																				
On vessels:																				
S.S. Chiloe at Antofagasta	C								1											
S.S. Conte Verde at Bombay from Singapore	C							1												

Place		February 1933	March 1933	April 1933	May 1933	June 1933	July 1933
Basutoland	C	44	37	93	233		
Bolivia	C	33	72	190	98	71	36
Czechoslovakia	C	13	9	32	31	9	6
Greece	C	2	3	3	12	6	
Guatemala	C	9	11	14	8	3	1
Peru	C		41	21	28	23	
Turkey (see also table above)	C	11	8	12	16	13	5
Union of Socialist Soviet Republics	C	2,773	2,985				

Place		February 1933	March 1933	April 1933	May 1933	June 1933	July 1933
Union of South Africa:							
Cape Province	C	74	83	130	189	124	
Natal	C	15	1	8	6	122	
Orange Free State	C	16	22	45	15	34	
Transvaal	C		3	1	1	7	
Yugoslavia	C	125	12			136	

YELLOW FEVER

Place		Feb. 5–Mar. 4, 1933	Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Apr. 30–May 27, 1933	Week ended— June 1933: 3	June 10	June 17	June 24	July 1933: 1	July 8	July 15	July 22	July 29	August 1933: 5	Aug. 12	Aug. 19	Aug. 26	Sept. 2, 1933
Brazil:																			
Ceara State:																			
Araripe	C	2																	
	D	2																	
Lavras	C							1											
	D							1											
Limoeiro	C			1															
	D			1															
St. Matheus	C								1										
	D								1										
Pernambuco State:																			
Granito	C												2						
	D												2						
Novo Exu [1]	C											1							
	D											1							
Salgueiro	C				1														
	D				1														
French West Africa: Niger Territory	C																	2	1
	D																	2	
Gold Coast	C	2			2				1										
	D	2																	
Ivory Coast:																			
Bouafle	C								1										
Gagnoa	C							[2] 1											
	D							1											
Senegal:																			
Bakel	C		1																
Dagana	C		1																
	D		1																
Podor	C		1																
St. Louis	D											[3] 1							

[1] 2 cases of yellow fever with 2 deaths were reported in Novo Exu, Pernambuco State, Brazil, during the month of June 1933.
[2] Suspected.
[3] Imported.

X

UNITED STATES TREASURY DEPARTMENT

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ISSUED WEEKLY

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IN THIS ISSUE

Estimating Small Amounts of Fluorides in Drinking Water
Rural Health Service in the United States, 1929 to 1932
Deaths in Large Cities During Week Ended September 16
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

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PUBLIC HEALTH REPORTS

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ESTIMATION OF FLUORIDES IN WATERS

By Elias Elvove, *senior chemist, National Institute of Health, United States Public Health Service*

The association of the human dental lesion known as "mottled enamel" with fluoride in the drinking water (2, 5, 6) makes it desirable to have a convenient method for detecting and estimating fluorides in such waters. A colorimetric method would probably be most convenient and enable one to deal with comparatively very small quantities of fluoride.

It appeared that the zirconium-alizarin reagent of DeBoer (4) might be utilized in this connection. Willard and Winter (8), however, state that they attempted to use the colorimetric method based upon a zirconium-alizarin mixture but that their results did not show any definite relation between the fluorine content and the fading of the color. On the other hand, Casares and Casares (1) utilized this reagent for determining fluorides in mineral waters, and Thompson and Taylor (7) applied it to the determination of fluorides in sea water.

Casares and Casares used a series of standards ranging from 1 to 3.5 mg of NaF in 100 cc, i.e., their lowest standard corresponded to about 0.45 mg of fluorine in 100 cc, or 4.5 parts per million. Thompson and Taylor used a series of standards ranging from 0.08 to 0.16 mg of fluorine per 100 cc, which would indicate that by their improved procedure as little as 0.08 mg of fluorine per 100 cc, or 0.8 parts per million, could be detected.

Thompson and Taylor acidified their waters by adding 2 cc of 6 N HCl to 100 cc of the sample, which is about the same hydrochloric acid concentration employed by Casares and Casares, who used 1 cc of the concentrated (approx. 12 N) hydrochloric acid to 100 cc of the sample. As previously mentioned, their lowest standard contained 0.08 mg fluorine. The results obtained in the present study, however, indicated that by using a hydrochloric acid concentration obtained by adding 5 cc of 5 N HCl to 50 cc of water, as little as 0.01 mg of fluorine in 50 cc, or 0.2 parts per million, could be differentiated from the corresponding control by means of the zirconium-alizarin reagent as here employed.

After some preliminary experiments, the following procedure was adopted and used in estimating the fluorides [1] in the waters [2] listed in the accompanying table.

PROCEDURE

To 50 cc of the sample of water, or a smaller quantity diluted to 50 cc with distilled water, and to each of 50 cc of standards containing known amounts of fluoride in water of similar composition as the sample (prepared on the basis of the analysis), there were added [3] 5 cc of 5 N HCl and 1 cc of the diluted [4] zirconium-alizarin reagent, mixing [5] well after each addition. All were allowed to stand, at room temperature, over night (about 18 hours) [6] and then the color of the sample was compared, in 50 cc (tall form) Nessler tubes, with the colors of the fluoride standards.

The fluoride standards were prepared from sodium fluoride, the stock solution usually employed containing a quantity of sodium fluoride equivalent to 0.05 mg fluorine per cubic centimeter. The fluorine quantities of the standards were 0, 0.01, 0.02, 0.03, 0.04, 0.045, 0.05, and 0.055 mg, respectively. It was intended to take a quantity of the sample which would make its fluorine content [7] about 0.04 to 0.05 mg.

[1] The estimation of fluorides in these waters represents part of the work of a preliminary survey for the purpose of selecting suitable localities for further study, particularly with reference to a possible correlation of the quantities of fluorides in the drinking waters with the observed degrees of mottled enamel. For the latter purpose, it will, of course, be necessary to make more than single determinations, in order to be able to allow for possible seasonal variations or variations in fluorine content due to some other factors.

[2] Assistant chemist C. G. Remsburg assisted in the determinations other than fluorides, using the methods given in the Standard Methods of Water Analysis of the American Public Health Association.

[3] Since the highest concentration of bicarbonate (645.4 p.p.m.) encountered in this series corresponded to only about 0.1 cc of the 5 N HCl, and since the water used for the standards contained the same quantity as the sample, no additional HCl was added to balance the alkalinity of the waters.

[4] The diluted zirconium-alizarin reagent was prepared by diluting 1 volume of the more concentrated with 2 volumes of distilled water. The latter was prepared by mixing equal volumes of 0.5-percent aqueous solution of zirconium oxychloride ($ZrOCl_2.8H_2O$) and 0.1-percent aqueous solution of alizarin sodium monosulphonate (Harmer Laboratories Co., Philadelphia). It was found advantageous to add the alizarin solution slowly to the zirconium solution rather than in the reverse order, since when the zirconium solution was added to the alizarin solution, it was often necessary to let the mixture stand much longer (about 18 hours) before it became entirely clear. Although the reagent appears to be fairly stable when kept in a cool dark closet, it was generally used before it was more than a few days old.

[5] Erlenmeyer flasks of about 125 cc capacity were found convenient in this connection. It is preferable, however, to transfer the mixed solutions to the Nessler tubes as soon as practicable. The solutions should also be mixed well immediately before the colorimetric comparisons, since there appears a tendency for the coloring matter to precipitate out on standing.

[6] It was found possible, in some cases, to obtain fair readings after the treated fluoride solutions were allowed to stand at room temperature for only about 4 hours. It appears advantageous, however, to use the longer (over night) standing time, especially since the work can often be arranged so as to make the latter more convenient.

[7] It appears that the reagent can be utilized most advantageously when the fluorine content is of a magnitude which will cause most of the reddish color to fade out. Under the present conditions this occurred when it was about 0.04 to 0.05 mg. Under these conditions the results obtained were within approximately 15 percent of the theory, which, for some practical purposes, are probably sufficiently close and useful, at least in preliminary surveys.

Analyses of waters containing fluorides

[In parts per million]

Description and source of sample	Residue on evaporation	Loss on ignition	Fixed residue	Silica (SiO_2)	Phosphate (PO_4)	Iron (Fe)	Aluminum (Al)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (calculated as Na)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate HCO_3	Sulphate (SO_4)	Nitrate (NO_3)	Chloride (Cl)	Fluoride (F)
Spring water, Twomey Springs, Tenn	154.0	41.0	113.0	16.0	0	0.10	0.04	38.6	3.7	6.3			10.2	96.4	19.7	0.2	4 0	0.2
Spring water, Mount Pleasant, Tenn	210.5	68.5	142.0	14.5	1.8	.10	.04	48.6	3.7	6.3			7.2	80.5	36.2	24.2	11.5	.4
Well water, Fort Stanton, N.Mex	363.5	64.5	299.0	15.8	0	.05	.23	69.9	12.5	22.9				133.6	139.9	.4	17.5	.6
Water from pipe line at Fort Stanton, N.Mex	168.0	32.0	136.0	24.0	0	.15	.41	31.2	1.8	15.3				71.4	45.6	1.2	7.0	.6
Cistern water (O'Neil), Rosiclare, Ill	68.0	13.0	55.0	2.0	0	.15	1.08	19.3	1.6	3.7				52.5	10.5	1.1	1.8	.6
Well water, Rosiclare, Ill	598.0	106.0	492.0	27.6	0	.24	.88	141.5	33.1	20.0				468.5	80.6	21.5	36.0	.6
Cistern water (near mine), Rosiclare, Ill	110.6	31.6	79.0	11.4	0	.15	1.21	30.7	1.7	2.8			15.6	50.0	14.4	.9	1.5	.7
Water 420 feet below ground level at Mexico, Ky	352.5	90.2	262 3	12.0	0	.25	1.28	77.2	21.8	8.7				270.8	74.9	.2	5.0	1.2
Spring water, near Cave in Rocks, Ill	314.8	65.0	249.8	16.0	0.9	.20	1.17	97.9	6.7	8.3				306.2	29.8	.6	5.5	1.5
Municipal water, Monmouth, Ill	1,061.2	89.6	971.6	46.2	0	.10	.45	66.8	30.4	242.9				288.5	402.8	3.0	118.0	2.0
Municipal water, Fairbury, Ill	1,388.0	30.5	1,357.5	10.8	0	.20	.05	43.6	17.9		435.9	50.3	10.8	392.8	76.9	.9	555.3	2.5
Municipal water, Windsor, N.C	721.8	9.8	712.0	13.5	0	.15	.15	1.4	1.6	275.6			18.6	374.5	71.8	.9	134.3	2.6
Municipal water, Minonk, Ill	1,919.2	31.7	1,887.5	8.3	0	.13	.10	49.0	15.7		650.7	42.5		414.8	173.2	.4	790.8	2.8
Municipal water, Amarillo, Tex	419.4	86.9	332.5	58.0	0	.05	.60	47.9	45.1	32.7				358.0	48.9	2.8	9.8	3.5
Municipal water, Myrtle Beach, S.C	796.0	9.0	787.0	29.4	0	.10	.10	3.4	2.4	317.1			20.4	645.4	6 6	.8	86.5	4.2
Well water (Oliver), near Conway, S.C	632.0	8.7	623.3	6.8	0	.05	.09	3.2	2.2	255.6			14.4	575.8	4.9	.9	45.5	4.5
Well water (Procter), near Conway, S.C	635.5	3.8	631.7	8.8	1.3	.05	.09	3.6	4.3	255.1			15.6	585.0	8.7	.8	44.3	4.5
Well water (Edwards), Courtland, Va	245.8	9.8	236.0	27.4	3.2	.10	.03	.6	.7	85.7				176.9	13.9	.3	16.3	5 0
Well water (Yates-Williams), Courtland, Va	304.1	15.1	289.0	19.9	2.8	.08	.04	1.2	.8	112.3				228.8	13.4	.5	23.3	6.0
Municipal water, Marion, Ky	1,152.0	148.0	1,004.0	15.0	0	.05	2.58	215.8	49.1	59.1				225.7	571.8	.1	46.5	20.0

The samples of water listed in the table, the fluoride contents of which were estimated by the procedure here described, were collected mostly by Dental Surg. H. T. Dean[8] in connection with field studies of mottled enamel.[9]

SUMMARY

A procedure is described for estimating approximately small amounts of fluorides in drinking water, which utilizes the zirconium-alizarin reagent for fluoride. The results obtained in the analyses of 20 samples of water from various localities are reported.

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EXTENT OF RURAL HEALTH SERVICE IN THE UNITED STATES, JANUARY 1, 1929–DECEMBER 31, 1932

According to data obtained by the United States Public Health Service from the health departments of the States, table 1 presents a list, by States, of counties, townships, or districts in which the rural sections thereof at the beginning of the calendar years 1929, 1930, 1931, and 1932, and on December 31, 1932, respectively, were provided with health service under the administration of local whole-time health officers.

The list for the year ended December 31, 1932, includes, as it did at the beginning of the calendar year, all counties, townships, or districts which are operating in groups under the direction of local whole-time health officers who are maintained jointly by the pooling of local official appropriations. Also all counties, townships, or districts are included in which there are whole-time local health organizations maintained entirely by the State health departments.

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[8] According to the writer's information, Dr. Dean collected personally all of the samples of water listed in this article excepting those from Monmouth, Ill., Amarillo, Tex., and Fort Stanton, N.Mex., in which cases the samples were collected for him by other persons.

[9] Brief references to some of these studies have already been published (3). It is expected that further details will appear later.

In this report the figures are shown as of December 31 instead of January 1 as heretofore, in order to make the report coincide with the reports of other national agencies collecting similar data.

TABLE 1.—*List of counties, townships, or districts in which as of Jan. 1, 1929, 1930, 1931, and 1932, respectively, and Dec. 31, 1932, rural sections were provided with health service under local whole-time health officers*

ALABAMA

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Baldwin	Baldwin	Baldwin	Baldwin	Baldwin
Barbour	Barbour	Barbour	Barbour	Barbour
Blount	Blount	Blount	Blount	Blount
Bullock	Bullock	Bullock	Bullock	Bullock
Calhoun	Calhoun	Calhoun	Calhoun	Calhoun
Chambers	Chambers	Chambers	Chambers	Chambers
Cherokee	Cherokee	Cherokee	Cherokee	Cherokee
Clarke	Choctaw	Choctaw	Choctaw	Choctaw
Cleburne	Clarke	Clarke	Clarke	Clarke
Coffee	Cleburne	Cleburne	Cleburne	Cleburne
Colbert	Coffee	Coffee	Coffee	Coffee
Conecuh	Colbert	Colbert	Colbert	Colbert
Covington	Conecuh	Conecuh	Conecuh	Conecuh
Crenshaw	Covington	Covington	Covington	Covington
Cullman	Crenshaw	Crenshaw	Crenshaw	Crenshaw
Dale	Cullman	Cullman	Cullman	Cullman
Dallas	Dale	Dale	Dale	Dale
De Kalb	Dallas	Dallas	Dallas	Dallas
Elmore	De Kalb	De Kalb	De Kalb	De Kalb
Escambia	Elmore	Elmore	Elmore	Elmore
Etowah	Escambia	Escambia	Escambia	Escambia
Franklin	Etowah	Etowah	Etowah	Etowah
Houston	Franklin	Franklin	Franklin	Franklin
Jackson	Geneva	Geneva	Geneva	Geneva
Jefferson	Houston	Houston	Houston	Houston
Lamar	Jackson	Jackson	Jackson	Jackson
Lauderdale	Jefferson	Jefferson	Jefferson	Jefferson
Lawrence	Lamar	Lamar	Lamar	Lamar
Lee	Lauderdale	Lauderdale	Lauderdale	Lauderdale
Limestone	Lawrence	Lawrence	Lawrence	Lawrence
Lowndes	Lee	Lee	Lee	Lee
Macon	Limestone	Limestone	Limestone	Limestone
Madison	Lowndes	Lowndes	Lowndes	Lowndes
Marengo	Macon	Macon	Macon	Macon
Marshall	Madison	Madison	Madison	Madison
Mobile	Marengo	Marengo	Marengo	Marengo
Monroe	Marshall	Marion	Marion	Marion
Montgomery	Mobile	Marshall	Marshall	Marshall
Morgan	Monroe	Mobile	Mobile	Mobile
Pickens	Montgomery	Monroe	Monroe	Monroe
Pike	Morgan	Montgomery	Montgomery	Montgomery
Shelby	Pickens	Morgan	Morgan	Morgan
Sumter	Shelby	Perry	Perry	Perry
Talladega	Sumter	Pickens	Pickens	Pickens
Tallapoosa	Talladega	Pike	Pike	Pike
Tuscaloosa	Tallapoosa	Shelby	Shelby	Shelby
Walker	Tuscaloosa	Sumter	Sumter	Sumter
Washington	Walker	Talladega	Talladega	Talladega
Wilcox	Washington	Tallapoosa	Tallapoosa	Tallapoosa
Winston	Wilcox	Tuscaloosa	Tuscaloosa	Tuscaloosa
	Winston	Walker	Walker	Walker
		Washington	Washington	Washington
		Wilcox	Wilcox	Wilcox
		Winston	Winston	Winston

ARIZONA

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Cochise	Cochise	Cochise	Cochise	Cochise
Coconino	Coconino	Coconino	Gila	Gila
Yuma	Yuma	Gila	Maricopa	Maricopa
		Maricopa	Pima	Pima
		Pima	Yuma	
		Yuma		

TABLE 1.—*List of counties, townships, or districts in which as of Jan. 1, 1929, 1930, 1931, and 1932, respectively, and Dec. 31, 1932, rural sections were provided with health service under local whole-time health officers*—Continued

ARKANSAS

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Arkansas	Arkansas	Arkansas	Arkansas [1]	Arkansas [1]
Ashley	Ashley	Ashley	Ashley	Ashley
Chicot	Conway	Clark	Bradley	Bradley
Conway	Cross	Conway	Clark	Chicot
Crittenden	Desha	Cross	Cleburne	Clark
Cross	Drew	Desha	Conway	Cleveland
Desha	Garland	Drew	Crittenden	Conway
Drew	Jackson	Garland	Cross	Crittenden
Faulkner	Jefferson	Jackson	Desha	Cross
Garland	Little River	Jefferson	Drew	Drew
Jackson	Mississippi	Little River	Garland	Garland
Jefferson	Monroe	Lonoke	Jackson	Jackson
Little River	Phillips	Mississippi	Jefferson	Jefferson
Mississippi	Pope	Monroe	Little River	Lincoln
Monroe	Pulaski	Ouachita	Lonoke [1]	Little River
Phillips	Saline	Phillips	Miller	Lonoke [1]
Pope	Sebastian	Pope	Mississippi	Mississippi
Pulaski	Union	Pulaski	Monroe	Monroe
Saline	White	Saline	Ouachita	Ouachita
Sebastian	Woodruff	Sebastian	Perry	Phillips
Union	Yell	Union	Phillips	Pope
White		White	Pope	Prairie [1]
Woodruff		Woodruff	Prairie [1]	Pulaski
Yell		Yell	Pulaski	Saline
			Saline	Sebastian
			Sebastian	Woodruff
			Union	Yell
			White	
			Woodruff	
			Yell	

CALIFORNIA

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Contra Costa	Contra Costa	Contra Costa	Contra Costa	Contra Costa
Los Angeles	Los Angeles	Imperial	Imperial	Imperial
Madera	Madera	Los Angeles	Los Angeles	Los Angeles
Monterey	Monterey	Madera	Madera	Madera
Orange	Orange	Monterey	Monterey	Monterey
Riverside	Riverside	Orange	Orange	Orange
San Diego	San Diego	Riverside	Riverside	Riverside
San Joaquin	San Joaquin	San Diego	San Bernardino	San Bernardino
San Luis Obispo	San Luis Obispo	San Joaquin	San Diego	San Diego
Santa Barbara	Santa Barbara	San Luis Obispo	San Joaquin	San Joaquin
Yolo	Stanislaus	Santa Barbara	San Luis Obispo	San Luis Obispo
	Yolo	Stanislaus	Santa Barbara	Santa Barbara
		Yolo	Stanislaus	Stanislaus
			Yolo	Yolo

COLORADO

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Otero	Otero	Otero	Otero	

CONNECTICUT

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Fairfield [2]	Fairfield [2]	Fairfield [2]	Fairfield [2]	Fairfield [2]
				West Hartford [2]

DELAWARE

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Kent	Kent	Kent	Kent	Kent
Newcastle	Newcastle	Newcastle	Newcastle	Newcastle
Sussex	Sussex	Sussex	Sussex	Sussex

[1] Included in 1 district of 3 counties.

[2] Township.

TABLE 1.—*List of counties, townships, or districts in which as of Jan. 1, 1929, 1930, 1931, and 1932, respectively, and Dec. 31, 1932, rural sections were provided with health service under local whole-time health officers*—Continued

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
FLORIDA				
Manatee Polk Sarasota	Manatee Sarasota	Leon Manatee Taylor	Leon Taylor	Escambia Leon Taylor
GEORGIA				
Baldwin Bartow Bibb Brooks Chatham Clarke Cobb Coffee Colquitt Crisp Decatur De Kalb Dougherty Emanuel Floyd Glynn Grady Hall Laurens Lowndes Mitchell Richmond Spalding Sumter Thomas Troup Walker Ware Washington Wayne Worth	Baldwin Bartow Bibb Brooks Chatham Clarke Clinch Cobb Coffee Colquitt Crisp Decatur De Kalb Dougherty Emanuel Floyd Glynn Grady Hall Jefferson Jenkins Laurens Lowndes Mitchell Richmond Spalding Sumter Thomas Troup Walker Ware Washington Wayne Worth	Baldwin Bartow Bibb Brooks Chatham Clarke Clinch Cobb Coffee Colquitt Decatur De Kalb Dougherty Floyd Glynn Grady Hall Jefferson Jenkins Laurens Lowndes Mitchell Richmond Spalding Sumter Thomas Troup Walker Ware Washington	Baldwin Bartow Bibb Brooks Catoosa [1] Chatham Chatooga [2] Clarke Cobb Coffee Colquitt Dade [2] Decatur De Kalb Dougherty Floyd Glynn Gordon [1] Grady Hall Jefferson Jenkins Laurens Lowndes Mitchell Murray [1] Richmond Spalding Sumter Thomas Troup Walker [2, 3] Ware Washington Whitfield [1]	Baldwin Bartow Bibb Brooks Catoosa [1] Chatham Clarke Cobb Colquitt Dade [2] Decatur De Kalb Dougherty Floyd Fulton Glynn Grady Hall Jefferson Jenkins Laurens Lowndes Mitchell Richmond Spalding Sumter Thomas Troup Walker [2] Ware Washington
IDAHO				
	Bonneville Twin Falls	Twin Falls	Twin Falls	Twin Falls
ILLINOIS				
Cook Du Page Morgan Pulaski	Du Page Morgan	Du Page Morgan	Du Page	Du Page
IOWA				
		Washington Woodbury	Des Moines Washington Woodbury	Des Moines Washington Woodbury

[1] Included in 1 district of 4 counties.
[2] Included in 1 district of 3 counties.
[3] Walker County also included in a tricounty district.

TABLE 1.—*List of counties, townships, or districts in which as of Jan. 1, 1929, 1930, 1931, and 1932, respectively, and Dec. 31, 1932, rural sections were provided with health service under local whole-time health officers*—Continued

KANSAS

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Brown	Brown	Brown	Brown	Brown
Butler	Butler	Butler	Butler	Geary
Cherokee	Cherokee	Cherokee	Cherokee	Lyon
Geary	Dickinson	Dickinson	Dickinson	Marion
Greenwood	Geary	Geary	Geary	Sedgwick
Jefferson	Greenwood	Greenwood	Greenwood	Shawnee
Lyon	Lyon	Lyon	Lyon	
Marion	Marion	Marion	Marion	
Ottawa	Ottawa	Ottawa	Sedgwick	
Shawnee	Sedgwick	Sedgwick	Shawnee	
	Shawnee	Seward		
		Shawnee		

KENTUCKY

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Ballard	Ballard	Bell	Adair	Adair
Bell	Bell	Boyd	Allen	Allen
Boyd	Boyd	Breathitt	Anderson	Anderson
Breathitt	Breathitt	Bullitt	Barren	Barren
Bullitt	Bullitt	Calloway	Bath	Bath
Carlisle	Calloway	Carlisle	Bell	Bell
Carter	Carlisle	Carter	Boyd	Boyd
Daviess	Carter	Daviess	Breathitt	Breathitt
Elliott	Daviess	Elliott	Bullitt	Bullitt
Estill	Elliott	Estill	Butler	Butler
Fayette	Estill	Fayette	Caldwell	Caldwell
Floyd	Fayette	Floyd	Calloway	Calloway
Fulton	Floyd	Fulton	Carlisle	Carlisle
Henderson	Fulton	Henderson	Carter	Carter
Hickman	Henderson	Hickman	Casey	Casey
Hopkins	Hickman	Hopkins	Clinton	Clinton
Johnson	Hopkins	Jefferson	Daviess	Daviess
Knott	Jefferson	Kenton	Edmonson	Edmonson
Knox	Johnson	Knott	Elliott	Elliott
Lawrence	Kenton	Knox	Estill	Estill
Lee	Knott	Lawrence	Fayette	Fayette
Leslie	Knox	Lee	Fleming	Fleming
Letcher	Lawrence	Leslie	Floyd	Floyd
Magoffin	Lee	Letcher	Fulton	Fulton
Martin	Leslie	Lincoln	Gallatin	Gallatin
Mason	Letcher	Madison	Grant	Grant
McLean	Magoffin	Magoffin	Grayson	Grayson
Menifee	Martin	Martin	Green	Green
Monroe	Mason	Mason	Greenup	Greenup
Morgan	McLean	McLean	Hancock	Hancock
Ohio	Menifee	Menifee	Harrison	Hart
Owsley	Monroe	Monroe	Hart	Henderson
Perry	Morgan	Morgan	Henderson	Hickman
Pike	Muhlenberg	Muhlenberg	Hickman	Hopkins
Scott	Ohio	Ohio	Hopkins	Jackson
Trigg	Owsley	Owsley	Jackson	Jefferson
Webster	Perry	Perry	Jefferson	Kenton
Whitley	Pike	Pike	Kenton	Knott
Wolfe	Scott	Scott	Knott	Knox
	Trigg	Trigg	Knox	Laurel
	Union	Union	Laurel	Lawrence
	Wayne	Wayne	Lawrence	Lee
	Webster	Webster	Lee	Leslie
	Whitley		Leslie	Letcher
	Wolfe		Letcher	Lewis
			Lewis	Lincoln
			Lincoln	McCreary
			McCreary	McLean
			McLean	Madison
			Madison	Magoffin
			Magoffin	Marshall
			Marshall	Martin
			Martin	Mason
			Mason	Meade
			Meade	Menifee
			Menifee	Metcalfe
			Metcalfe	Monroe
			Monroe	Morgan
			Morgan	Muhlenberg
			Muhlenberg	Nicholas

TABLE 1.—*List of counties, townships, or districts in which as of Jan. 1, 1929, 1930, 1931, and 1932, respectively, and Dec. 31, 1932, rural sections were provided with health service under local whole-time health officers*—Continued

KENTUCKY—Continued

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
			Nicholas	Ohio
			Ohio	Owsley
			Owen	Perry
			Owsley	Pike
			Perry	Powell
			Pike	Pulaski
			Powell	Robertson
			Pulaski	Rockcastle
			Robertson	Rowan
			Rockcastle	Scott
			Rowan	Todd
			Scott	Trigg
			Todd	Trimble
			Trigg	Union
			Trimble	Warren
			Union	Wayne
			Warren	Webster
			Wayne	Whitley
			Webster	Wolfe
			Whitley	
			Wolfe	

LOUISIANA [1]

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Assumption	Assumption	Assumption	Assumption	Assumption
Avoyelles	Avoyelles	Avoyelles	Avoyelles	Avoyelles
Caddo	Caddo	Caddo	Caddo	Caddo
Caldwell	Caldwell	Caldwell	Caldwell	Caldwell
Catahoula	Catahoula	Catahoula	Catahoula	Catahoula
Claiborne	Claiborne	Claiborne	Claiborne	Claiborne
Concordia	Concordia	Concordia	Concordia	Concordia
De Soto	De Soto	De Soto	De Soto	De Soto
East Carroll	East Carroll	East Carroll	East Carroll	East Carroll
Franklin	Franklin	Franklin	Evangeline	Franklin
Iberia	Iberia	Iberia	Franklin	Iberia
Iberville	Iberville	Iberville	Iberia	Iberville
Lafayette	Lafayette	Lafayette	Iberville	Lafayette
Lafourche	Lafourche	Lafourche	Lafayette	Lafourche
La Salle	La Salle	La Salle	Lafourche	La Salle
Madison	Lincoln	Lincoln	La Salle	Lincoln
Morehouse	Madison	Madison	Lincoln	Madison
Natchitoches	Morehouse	Morehouse	Madison	Morehouse
Ouachita	Natchitoches	Natchitoches	Morehouse	Natchitoches
Point Coupee	Ouachita	Ouachita	Natchitoches	Ouachita
Rapides	Point Coupee	Point Coupee	Ouachita	Point Coupee
Richland	Rapides	Rapides	Point Coupee	Rapides
St. Landry	Richland	Richland	Rapides	Richland
St. Martin	St. Landry	St. Landry	Richland	St. Landry
St. Mary	St. Martin	St. Martin	St. Landry	St. Martin
Tensas	St. Mary	St. Mary	St. Martin	St. Mary
Terrebonne	Tensas	Tensas	St. Mary	Tensas
Webster	Terrebonne	Terrebonne	Tensas	Terrebonne
West Carroll	Washington	Washington	Terrebonne	Washington
	Webster	Webster	Washington	Webster
	West Carroll	West Carroll	Webster	West Carroll
			West Carroll	

MAINE

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Motbov Union [2]	Motbov Union [2]	Motbov Union [2]	Bar Harbor	Bar Harbor
Rumford [3]	Rumford [3]	Rumford [3]	Bucksport	Cooperative Health Union [4]
Sanford [3]	Sanford [3]	Sanford [3]	Cooperative Health Union [4]	Motbov Union [2]
Vassalboro [3]	Vassalboro [3]	Vassalboro [3]	Motbov Union [2]	Rumford [3]
			Rumford [3]	Sanford [3]
			Sanford [3]	

[1] Parishes.
[2] Including municipalities of Orono, Milford, Bradley, Veazie, and Old Town.
[3] Town (township) wholly or partly rural.
[4] Including towns of Avon, Chesterville, Eustis, Livermore, Phillips, Rangeley, Strong, Temple, Weld, and Wilton.

TABLE 1.—*List of counties, townships, or districts in which as of Jan. 1, 1929, 1930, 1931, and 1932, respectively, and Dec. 31, 1932, rural sections were provided with health service under local whole-time health officers*—Continued

MARYLAND

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Allegany	Allegany	Allegany	Allegany	Allegany
Baltimore	Baltimore	Anne Arundel	Anne Arundel	Anne Arundel
Calvert	Calvert	Baltimore	Baltimore	Baltimore
Carroll	Carroll	Calvert	Calvert	Calvert
Frederick	Cecil	Carroll	Carroll	Carroll
Harford	Frederick	Cecil	Cecil	Cecil
Montgomery	Harford	Frederick	Dorchester	Charles
Prince Georges	Montgomery	Harford	Frederick	Dorchester
Talbot	Prince Georges	Kent	Garrett	Frederick
	Talbot	Montgomery	Harford	Garrett
	Wicomico	Prince Georges	Kent	Harford
		Talbot	Montgomery	Howard
		Washington	Prince Georges	Kent
		Wicomico	Queen Annes	Montgomery
			Talbot	Prince Georges
			Washington	Queen Annes
			Wicomico	Somerset
			Worcester	Talbot
				Washington
				Wicomico
				Worcester

MASSACHUSETTS

Barnstable	Barnstable	Barnstable	Barnstable	Barnstable [5]
			Nashoba	Nashoba
			Southern Berkshire	Southern Berkshire [6]

MICHIGAN

Oakland	Genesee	Alcona [1]	Alcona [1]	Alcona [1]
Saginaw	Oakland	Alpena [1]	Alpena [1]	Allegan
Wexford	Saginaw	Antrim [1]	Antrim [1]	Alpena [1]
	Wexford	Charlevoix [1]	Barry	Antrim [1]
		Cheboygan [1]	Charlevoix [1]	Barry
		Crawford [1]	Cheboygan [1]	Charlevoix [1]
		Emmet [1]	Crawford [1]	Cheboygan [1]
		Genesee	Emmet [1]	Crawford [1]
		Iosco [1]	Genesee	Emmet [1]
		Isabella	Iosco [1]	Genesee
		Kalkaska [1]	Isabella	Iosco [1]
		Kent	Kalkaska [1]	Isabella
		Midland	Kent	Kalkaska [1]
		Missaukee [1]	Midland	Kent
		Montmorency [1]	Missaukee [1]	Lake [2]
		Oakland	Montmorency [1]	Midland
		Ogemaw [1]	Oakland	Missaukee [1]
		Oscoda [1]	Ogemaw [1]	Montmorency [1]
		Otsego [1]	Oscoda [1]	Newaygo [2]
		Ottawa	Otsego [1]	Oakland
		Presque Isle [1]	Ottawa	Oceana [2]
		Roscommon [1]	Presque Isle [1]	Ogemaw [1]
		Saginaw	Roscommon [1]	Oscoda [1]
		Wexford	Saginaw	Otsego [1]
			Wexford	Ottawa
				Presque Isle [1]
				Roscommon [1]
				Saginaw
				Wexford

MINNESOTA

St. Louis	St. Louis	St. Louis	St. Louis	St. Louis

[1] Included in 4 districts of 4 counties each.
[2] Included in 1 district of 3 counties.
[5] Represents 14 towns.
[6] Represents 16 towns.

TABLE 1.—*List of counties, townships, or districts in which as of Jan. 1, 1929, 1930, 1931, and 1932, respectively, and Dec. 31, 1932, rural sections were provided with health service under local whole-time health officers*—Continued

MISSISSIPPI

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Adams	Adams	Adams	Adams	Adams
Bolivar	Bolivar	Bolivar	Bolivar	Bolivar
Clarke	Clarke	Clarke	Clarke	Coahoma
Coahoma	Coahoma	Coahoma	Coahoma	Copiah
Copiah	Copiah	Copiah	Copiah	Forrest
Forrest	Forrest	Forrest	Forrest	Hancock
Hancock	Hancock	Hancock	Hancock	Harrison
Harrison	Harrison	Harrison	Harrison	Hinds
Hinds	Hinds	Hinds	Hinds	Holmes
Holmes	Holmes	Holmes	Holmes	Humphreys
Humphreys	Humphreys	Humphreys	Humphreys	Jackson
Issaquena	Issaquena	Issaquena	Issaquena	Lamar
Jackson	Jackson	Jackson	Jackson	Lauderdale
Jones	Lamar	Lamar	Lamar	Lee
Lamar	Lauderdale	Lauderdale	Lauderdale	Leflore
Lauderdale	Lee	Lee	Lee	Lincoln
Lee	Leflore	Leflore	Leflore	Monroe
Leflore	Lincoln	Lincoln	Lincoln	Pearl River
Lincoln	Monroe	Monroe	Monroe	Perry
Monroe	Pearl River	Pearl River	Pearl River	Pike
Pearl River	Perry	Perry	Perry	Sunflower
Perry	Sharkey	Sharkey	Pike	Union
Sharkey	Sunflower	Sunflower	Sharkey	Warren
Sunflower	Tishomingo	Tishomingo	Sunflower	Washington
Tishomingo	Union	Union	Tishomingo	Yazoo
Union	Warren	Warren	Union	
Warren	Washington	Washington	Warren	
Washington	Yazoo	Yazoo	Washington	
Yazoo			Yazoo	

MISSOURI

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Boone	Boone	Boone	Boone	Boone
Dunklin	Buchanan	Buchanan	Buchanan	Buchanan
Greene	Dunklin	Dunklin	Dunklin	Dunklin
Jackson	Greene	Greene	Greene	Greene
Marion	Jackson	Jackson	Jackson	Jackson
Mississippi	Marion	Marion	Marion	Marion
New Madrid	Mississippi	Miller	Miller	Miller
Nodaway	New Madrid	New Madrid	New Madrid	New Madrid
Pemiscot	Nodaway	Nodaway	Pemiscot	Pemiscot
St. Francois	Pemiscot	Pemiscot	St Louis	St. Louis
St. Louis	St. Francois	St. Francois	Scott	
Scott	St. Louis	St. Louis		
	Scott	Scott		

MONTANA

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Cascade	Cascade	Cascade	Cascade	Cascade
Lewis and Clark	Gallatin	Gallatin	Gallatin	Gallatin
Missoula	Lewis and Clark	Lewis and Clark	Lewis and Clark	Lewis and Clark
	Missoula	Missoula	Missoula	Missoula

NEW MEXICO

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Bernalillo	Bernalillo	Bernalillo	Bernalillo	Bernalillo
Chaves	Chaves	Dona Ana	Dona Ana	Dona Ana
Dona Ana	Dona Ana	Eddy	Eddy	Eddy
Eddy	Eddy	Lea	Santa Fe	Santa Fe
Santa Fe	McKinley	McKinley	Union	Union
Union	Union	Santa Fe	Valencia	Valencia
Valencia	Valencia	Union		
		Valencia		

TABLE 1.—*List of counties, townships, or districts in which as of Jan. 1, 1929, 1930, 1931, and 1932, respectively, and Dec. 31, 1932, rural sections were provided with health service under local whole-time health officers*—Continued

NEW YORK

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Cattaraugus	Cattaraugus	Cattaraugus	Cattaraugus	Cattaraugus
Suffolk	Cortland	Cortland	Cortland	Cortland
	Suffolk	Suffolk	Suffolk	Suffolk
	Westchester	Westchester	Westchester	Westchester

NORTH CAROLINA

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Beaufort	Beaufort	Beaufort	Beaufort	Beaufort
Bertie	Bertie	Bertie	Bladen	Bladen
Bladen	Bladen	Bladen	Buncombe	Buncombe
Brunswick	Buncombe	Buncombe	Cabarrus	Cabarrus
Buncombe	Cabarrus	Cabarrus	Columbus	Columbus
Cabarrus	Cherokee	Cherokee	Cumberland	Cumberland
Columbus	Columbus	Columbus	Davidson	Davidson
Craven	Craven	Craven	Durham	Durham
Cumberland	Cumberland	Cumberland	Edgecombe	Edgecombe
Davidson	Davidson	Davidson	Forsyth	Forsyth [1]
Durham	Durham	Durham	Franklin	Franklin
Edgecombe	Edgecombe	Edgecombe	Gaston	Gaston
Forsyth	Forsyth	Forsyth	Granville	Granville
Gaston	Gaston	Franklin	Guilford	Guilford
Granville	Granville	Gaston	Halifax	Halifax
Guilford	Guilford	Guilford	Johnston	Lenoir
Halifax	Halifax	Granville	Lenoir	Mecklenburg
Henderson	Henderson	Halifax	Mecklenburg	Moore
Johnston	Johnston	Henderson	Moore	New Hanover
Lenoir	Lenoir	Johnston	New Hanover	Northampton
Mecklenburg	Mecklenburg	Lenoir	Northampton	Pitt
Moore	Moore	Mecklenburg	Pitt	Randolph
Nash	Nash	Moore	Randolph	Richmond
New Hanover	New Hanover	Nash	Richmond	Robeson
Northampton	Northampton	New Hanover	Robeson	Rowan
Pamlico	Pitt	Northampton	Rowan	Rutherford
Pitt	Randolph	Pitt	Rutherford	Sampson
Randolph	Richmond	Randolph	Sampson	Stokes [1]
Richmond	Robeson	Richmond	Stokes	Surry
Robeson	Rowan	Robeson	Surry	Vance
Rowan	Rutherford	Rowan	Vance	Wake
Rutherford	Sampson	Rutherford	Wake	Wayne
Sampson	Surry	Sampson	Wayne	Wilkes
Surry	Vance	Surry	Wilkes	Wilson
Vance	Wake	Vance	Wilson	Yadkin [1]
Wake	Wayne	Wake	Yadkin	
Wayne	Wilkes	Wayne		
Wilkes	Wilson	Wilkes		
Wilson		Wilson		

OHIO

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Allen	Allen	Allen	Allen	Allen
Ashtabula	Ashtabula	Ashtabula	Ashtabula	Ashtabula
Belmont	Belmont	Belmont	Belmont	Belmont
Butler	Butler	Butler	Butler	Butler
Clinton	Clinton	Clinton	Clinton	Clinton
Columbiana	Columbiana	Columbiana	Columbiana	Columbiana
Coshocton	Coshocton	Coshocton	Coshocton	Coshocton
Crawford	Crawford	Crawford	Crawford	Crawford
Cuyahoga	Cuyahoga	Cuyahoga	Cuyahoga	Cuyahoga
Darke	Darke	Darke	Darke	Darke
Delaware	Delaware	Delaware	Delaware	Delaware
Erie	Erie	Erie	Erie	Erie
Fayette	Fayette	Fayette	Fayette	Fayette
Franklin	Franklin	Franklin	Franklin	Franklin
Geauga	Geauga	Hamilton	Guernsey	Hamilton
Hamilton	Hamilton	Hancock	Hamilton	Hancock
Hancock	Hancock	Hocking	Hancock	Hocking
Hocking	Hocking	Huron	Hocking	Huron
Huron	Huron	Jackson	Huron	Jackson
Jefferson	Jefferson	Jefferson	Jackson	Jefferson
Lake	Lake	Lorain	Jefferson	Lorain
Lorain	Lorain	Lucas	Lorain	Lucas

[1] Included in one district of 3 counties.

TABLE 1.—*List of counties, townships, or districts in which as of Jan. 1, 1929, 1930, 1931, and 1932, respectively, and Dec. 31, 1932, rural sections were provided with health service under local whole-time health officers*—Continued

OHIO—Continued

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Lucas	Lucas	Mahoning	Lucas	Mahoning
Mahoning	Mahoning	Marion	Mahoning	Marion
Marion	Marion	Meigs	Marion	Medina
Meigs	Meigs	Mercer	Medina	Meigs
Mercer	Mercer	Miami	Meigs	Mercer
Miami	Miami	Montgomery	Mercer	Miami
Montgomery	Montgomery	Morrow	Miami	Montgomery
Morrow	Morrow	Muskingum	Montgomery	Morrow
Perry	Perry	Perry	Morrow	Perry
Preble	Pickaway	Pickaway	Perry	Pickaway
Richland	Preble	Preble	Pickaway	Preble
Ross	Richland	Richland	Preble	Richland
Sandusky	Ross	Ross	Richland	Ross
Scioto	Sandusky	Sandusky	Ross	Scioto
Seneca	Scioto	Scioto	Scioto	Seneca
Shelby	Seneca	Seneca	Seneca	Shelby
Stark	Shelby	Shelby	Shelby	Stark
Summit	Stark	Stark	Stark	Summit
Trumbull	Summit	Summit	Summit	Trumbull
Tuscarawas	Trumbull	Trumbull	Trumbull	Tuscarawas
Washington	Tuscarawas	Tuscarawas	Tuscarawas	Washington
Wayne	Washington	Washington	Washington	Wayne
Wood	Wayne	Wayne	Wayne	Wood
	Wood	Wood	Wood	

OKLAHOMA

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Carter	Carter	Carter	Carter	
Kay	Le Flore	Le Flore	Le Flore	
Le Flore	McCurtain	McCurtain	McCurtain	
McCurtain	Muskogee	Muskogee	Muskogee	
Muskogee	Okmulgee	Okmulgee	Okmulgee	
Okmulgee	Osage	Ottawa	Ottawa	
Osage	Ottawa	Pittsburg	Pittsburg	
Ottawa	Pittsburg	Pottawatomie	Pottawatomie	
Pittsburg	Seminole	Seminole	Seminole	
Seminole				

OREGON

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Clackamas	Clackamas	Clackamas	Clackamas	Clackamas
Coos	Coos	Coos	Coos	Coos
Douglas	Douglas	Douglas	Douglas	Douglas
Jackson	Jackson	Jackson	Jackson	Jackson
Klamath	Klamath	Klamath	Klamath	Klamath
Marion	Marion	Lane	Lane	Lane
Multnomah	Multnomah	Marion	Marion	Marion
		Multnomah	Multnomah	

PENNSYLVANIA

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
		Allegheny	Allegheny	Allegheny
		Bucks	Bucks	Bucks
		Luzerne	Luzerne	Luzerne

SOUTH CAROLINA

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Aiken	Aiken	Aiken	Aiken	Aiken
Anderson	Anderson	Anderson	Anderson	Anderson
Beaufort	Beaufort	Beaufort	Beaufort	Beaufort
Berkeley	Berkeley	Berkeley	Berkeley	Berkeley
Charleston	Charleston	Charleston	Charleston	Charleston
Cherokee	Cherokee	Cherokee	Cherokee	Cherokee
Darlington	Darlington	Darlington	Darlington	Darlington
Dillon	Dillon	Dillon	Dillon	Dillon
Dorchester	Dorchester	Dorchester	Dorchester	Dorchester
Fairfield	Fairfield	Fairfield	Fairfield	Fairfield
Georgetown	Florence	Florence	Florence	Florence

TABLE 1.—*List of counties, townships, or districts in which as of Jan. 1, 1929, 1930, 1931, and 1932, respectively, and Dec. 31, 1932, rural sections were provided with health service under local whole-time health officers*—Continued

SOUTH CAROLINA—Continued

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Greenville	Georgetown	Georgetown	Georgetown	Georgetown
Greenwood	Greenville	Greenville	Greenville	Greenville
Horry	Greenwood	Greenwood	Greenwood	Greenwood
Marion	Horry	Horry	Horry	Horry
Newberry	Kershaw	Kershaw	Kershaw	Kershaw
Oconee	Lexington	Lexington	Lexington	Lexington
Orangeburg	Marion	Marion	Marion	Marion
Richland	Newberry	Newberry	Newberry	Newberry
Spartanburg	Oconee	Oconee	Oconee	Oconee
	Orangeburg	Orangeburg	Orangeburg	Orangeburg
	Richland	Richland	Pickens	Pickens
	Spartanburg	Spartanburg	Richland	Richland
			Spartanburg	Spartanburg

SOUTH DAKOTA

Pennington	Pennington	Pennington	Pennington	Pennington

TENNESSEE

Blount	Bledsoe	Bledsoe	Bledsoe [1]	Bledsoe [1]
Bradley	Blount	Blount	Blount	Bradley
Carter	Bradley	Bradley	Bradley	Carter
Davidson	Carter	Carter	Carter	Clay [2]
Dyer	Clay	Clay	Clay [2]	Davidson [2]
Gibson	Davidson	Davidson	Cumberland	Dyer
Greene	Dyer	Dyer	Davidson [2]	Fentress [2]
Hamilton	Fentress	Fentress	Dyer	Gibson
Knox	Gibson	Gibson	Fentress [2]	Giles
Lake	Giles	Giles	Gibson	Greene
Lauderdale	Greene	Greene	Giles	Grundy [1]
Monroe	Grundy	Grundy	Greene	Hamilton
Montgomery	Hamilton	Hamilton	Grundy [1]	Hardeman
Obion	Hardeman	Hardeman	Hamilton	Humphreys
Roane	Jackson	Humphreys	Hardeman	Jackson [2]
Rutherford	Knox	Jackson	Humphreys	Knox
Sevier	Lake	Knox	Jackson [2]	Lake
Shelby	Lauderdale	Lake	Knox	Lauderdale
Sullivan	Lincoln	Lauderdale	Lake	Lewis
Washington	Meigs	Lewis	Lauderdale	Lincoln
Weakley	Monroe	Lincoln	Lewis	Maury
Williamson	Montgomery	Maury	Lincoln	Meigs [2]
Wilson	Obion	Meigs	Maury	Monroe
	Overton	Monroe	Meigs [2]	Montgomery
	Pickett	Montgomery	Monroe	Obion
	Rhea	Obion	Montgomery	Overton [2]
	Roane	Overton	Obion	Pickett [2]
	Rutherford	Pickett	Overton [2]	Rhea [2]
	Sequatchie	Rhea	Pickett [2]	Roane
	Sevier	Roane	Rhea [2]	Rutherford
	Shelby	Rutherford	Roane	Sequatchie [1]
	Sullivan	Sequatchie	Rutherford	Sevier
	Sumner	Sevier	Sequatchie [1]	Shelby
	Tipton	Shelby	Sevier	Sullivan
	Washington	Sullivan	Shelby	Sumner
	Weakley	Sumner	Sullivan	Tipton
	Williamson	Tipton	Sumner	Unicoi
	Wilson	Unicoi	Tipton	Washington
		Washington	Unicoi	Weakley
		Weakley	Washington	Williamson
		Williamson	Weakley	Wilson
		Wilson	Williamson	
			Wilson	

[1] Included in 1 district of 3 counties.
[2] Included in 4 districts of 2 counties each.

TABLE 1.—*List of counties, townships, or districts in which as of Jan. 1, 1929, 1930, 1931, and 1932, respectively, and Dec. 31, 1932, rural sections were provided with health service under local whole-time health officers*—Continued

TEXAS

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Cameron	Cameron	Cameron	Cameron [2]	Cameron
Hidalgo	Hidalgo	Hidalgo	Cass	Gregg
McLennan	Jefferson	Jefferson	Hidalgo [2]	Hidalgo
Tarrant	McLennan	McLennan	Jefferson	McLennan
	Nolan	Nolan	McLennan	Nolan
	Tarrant	Potter	Nolan	Potter
		Tarrant	Potter	Starr
			Starr [2]	Tarrant
			Willacy [2]	

UTAH

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Box Elder	Box Elder	Davis	Davis	Davis
Davis	Davis	Utah	Utah	Utah
Utah	Utah			

VIRGINIA

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Accomac	Accomac	Accomac	Accomac [3]	Accomac [3]
Albermarle	Albermarle	Albermarle	Albermarle	Albermarle
Arlington	Arlington	Amelia [1]	Amelia [1]	Amelia [1]
Augusta	Augusta	Appomattox [1]	Appomattox [1]	Appomattox [1]
Brunswick	Brunswick	Arlington	Arlington	Arlington
Greensville	Fairfax	Augusta	Augusta	Augusta
Halifax	Greensville	Brunswick	Brunswick [3]	Brunswick [3]
Henrico	Halifax	Buckingham [1]	Buckingham [1]	Buckingham [1]
Isle of Wight	Henrico	Charlotte [1]	Charlotte [1]	Charlotte [1]
Nansemond	Isle of Wight	Cumberland [1]	Cumberland [1]	Cumberland [1]
Norfolk	Nansemond	Fairfax	Fairfax	Fairfax
Northampton	Norfolk	Greensville	Greensville [3]	Greensville [3]
Princess Anne	Northampton	Halifax	Halifax	Halifax
Rockbridge	Princess Anne	Henrico	Henrico	Henrico
Southampton	Rockbridge	Isle of Wight	Isle of Wight [3]	Isle of Wight [3]
Wise	Southampton	Lunenburg [1]	Lunenburg [1]	Lunenburg [1]
	Wise	Nansemond	Nansemond [3]	Nansemond [3]
		Norfolk	Norfolk [3]	Norfolk [3]
		Northampton	Northampton [3]	Nottoway [1]
		Nottoway [1]	Nottoway [1]	Pittsylvania
		Powhatan [1]	Pittsylvania	Powhatan [1]
		Prince Edward [1]	Powhatan [1]	Prince Edward [1]
		Princess Anne	Prince Edward [1]	Princess Anne [3]
		Rockbridge	Princess Anne [3]	Rockbridge
		Southampton	Rockbridge	Southampton
		Wise	Southampton	
			Wise	

WASHINGTON

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932
Chelan	Chelan	Chelan	Chelan	Chelan
King	Clark	Clark	Clark	Clark
Snohomish	King	King	King	King
Spokane	Snohomish	Snohomish	Snohomish	Snohomish
Walla Walla	Spokane	Spokane	Spokane	Spokane
Whitman	Walla Walla	Walla Walla	Walla Walla	Walla Walla
Yakima	Whitman	Whitman	Whitman	Whitman
	Yakima	Yakima	Yakima	Yakima

[1] Included in 1 district of 9 counties.
[2] Included in 1 district of 4 counties.
[3] Included in 4 districts of 2 counties each.

TABLE 1.—*List of counties, townships, or districts in which as of Jan. 1, 1929, 1930, 1931, and 1932, respectively, and Dec. 31, 1932, rural sections were provided with health service under local whole-time health officers*—Continued

WEST VIRGINIA

Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan 1, 1932	Dec 31, 1932
Berkeley	Berkeley	Berkeley	Berkeley	Berkeley
Boone	Boone	Boone	Boone	Boone
Brooke	Brooke	Brooke	Brooke	Brooks
Fayette	Fayette	Fayette	Doddridge [1]	Fayette
Gilmer	Gilmer	Gilmer	Fayette	Hancock
Hancock	Hancock	Hancock	Hancock	Harrison
Harrison	Harrison	Harrison	Harrison	Kanawha
Kanawha	Kanawha	Kanawha	Kanawha	Logan
Logan	Logan	Logan	Logan	Marion
Marion	Marion	Marion	Marion	Marshall
Ohio	Monongalia	Marshall	Marshall	Monongalia
Preston	Ohio	Monongalia	Monongalia	Ohio
Raleigh	Preston	Ohio	Ohio	Preston
Wood	Raleigh	Preston	Pleasants [1]	Raleigh
	Wood	Raleigh	Preston	Wood
		Wood	Raleigh	
			Ritchie [1]	
			Tyler [1]	
			Wetzel [1]	
			Wood	

WYOMING

Natrona				

RÉSUMÉ OF TABLE 1

State	Number of counties					Increase or decrease in—			
	Jan. 1, 1929	Jan. 1, 1930	Jan. 1, 1931	Jan. 1, 1932	Dec. 31, 1932	1929	1930	1931	1932
Alabama	50	51	54	54	54	+1	+3	-------	-------
Arizona	3	3	6	5	4	-------	+3	−1	−1
Arkansas	24	21	24	30	27	−3	+3	+6	−3
California	11	12	13	14	14	+1	+1	+1	-------
Colorado	1	1	1	1	-------	-------	-------	-------	−1
Connecticut	1	1	1	1	2	-------	-------	-------	+1
Delaware	3	3	3	3	3	-------	-------	-------	-------
Florida	3	2	3	2	3	−1	+1	−1	+1
Georgia	31	34	30	35	31	+3	−4	+5	−4
Idaho	-------	2	1	1	1	+2	−1	-------	-------
Illinois	4	2	2	1	1	−2	-------	−1	-------
Iowa	-------	-------	2	3	3	-------	+2	+1	-------
Kansas	10	11	12	10	6	+1	+1	−2	−4
Kentucky	39	45	43	81	79	+6	−2	+38	−2
Louisiana	29	31	31	32	31	+2	-------	+1	−1
Maine	4	4	4	6	5	-------	-------	+2	−1
Maryland	9	11	14	18	21	+2	+3	+4	+3
Massachusetts	1	1	1	3	3	-------	-------	+2	-------
Michigan	3	4	24	25	29	+1	+20	+1	+4
Minnesota	1	1	1	1	1	-------	-------	-------	-------
Mississippi	29	28	28	29	25	−1	-------	+1	−4
Missouri	12	13	13	11	10	+1	-------	−2	−1
Montana	3	4	4	4	4	+1	-------	-------	-------
New Mexico	7	7	8	6	6	-------	+1	−2	-------
New York	2	4	4	4	4	+2	-------	-------	-------
North Carolina	39	38	39	36	35	−1	+1	−3	−1
Ohio	45	46	46	46	45	+1	-------	-------	−1
Oklahoma	10	9	9	9	-------	−1	-------	-------	−9
Oregon	7	7	8	8	7	-------	+1	-------	−1
Pennsylvania	-------	-------	3	3	3	-------	+3	-------	-------
South Carolina	20	23	23	24	24	+3	-------	+1	-------
South Dakota	1	1	1	1	1	-------	-------	-------	-------
Tennessee	23	38	42	43	41	+15	+4	+1	−2
Texas	4	6	7	9	8	+2	+1	+2	−1
Utah	3	3	2	2	2	-------	−1	-------	-------
Virginia	16	17	26	27	25	+1	+9	+1	−2
Washington	7	8	8	8	8	+1	-------	-------	-------
West Virginia	14	15	16	20	15	+1	+1	+4	−5
Wyoming	1	-------	-------	-------	-------	−1	-------	-------	-------
Total	470	507	557	616	581	+37	+50	+59	−35

[1] Included in 1 district of 5 counties.

Within the period January 1, 1932, to December 31, 1932, whole-time health service was established in 9 units and was discontinued in 44—a net loss of 35 units. The largest gain in one State was that

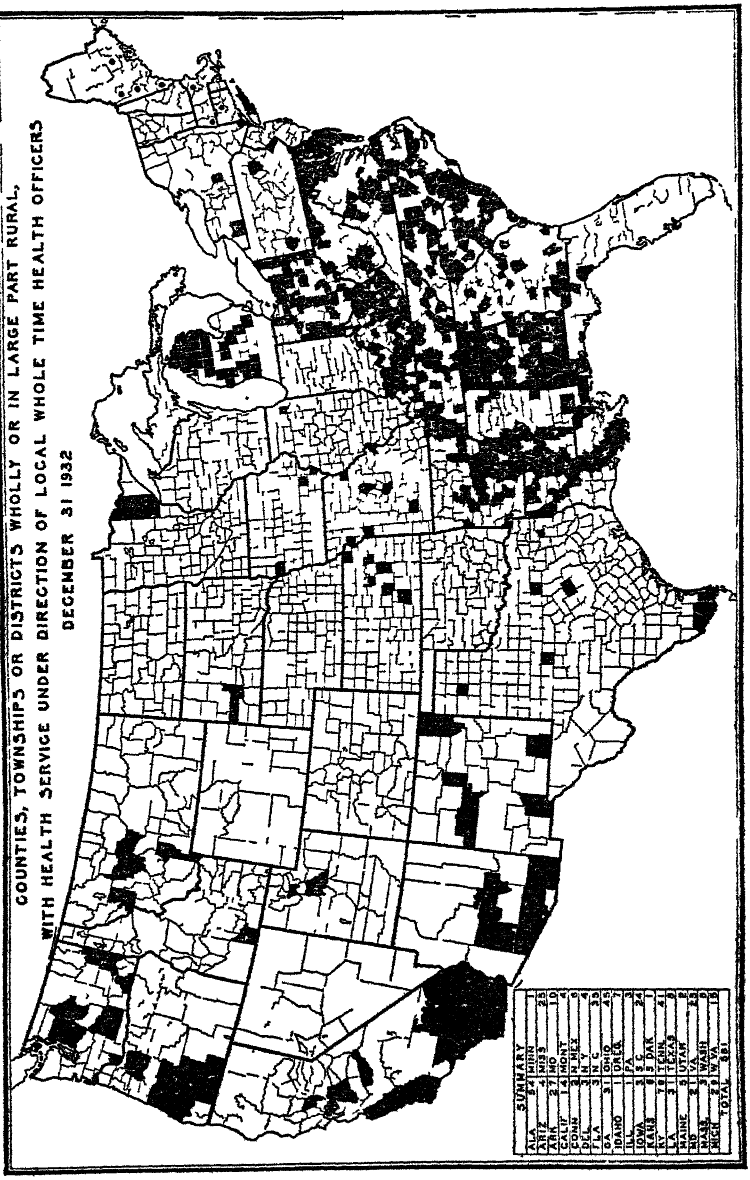

FIGURE 1.—Rural areas having whole-time health officers, December 31, 1932

of 4 units in Michigan, while the greatest loss sustained was 9 units in the State of Oklahoma, all counties in this State discontinuing their full-time health service on June 30, 1932.

The accompanying map (fig. 1) shows the location of the counties, townships, or districts in the United States in the rural sections of which health service under the direction of local whole-time health officers was in operation on December 31, 1932.

Table 2 presents, by States, the percentage of rural population having health service under the direction of local whole-time health officers at the end of the calendar year 1932.

TABLE 2.—*Percentage of rural population having on Dec. 31, 1932, health service under local whole-time health officers*

State	Rural population as of Dec. 31, 1932, (estimated from 1930 census)	Rural population with local health service under direction of whole-time health officers	Percentage of rural population with local health service under direction of whole-time health officers
Alabama	1, 918, 908	1, 644, 090	85. 7
Arizona	304, 250	171, 248	56. 3
Arkansas	1, 474, 259	642, 072	43. 6
California	1, 629, 741	789, 453	48. 4
Colorado	523, 833	0	0
Connecticut	483, 406	48, 016	9. 9
Delaware	118, 721	118, 721	100. 0
Florida	734, 131	46, 039	6. 3
Georgia	[1] 2, 013, 016	579, 064	28. 8
Idaho	316, 248	21, 300	6. 7
Illinois	[1] 1, 994, 927	25, 712	1. 3
Indiana	[1] 1, 442, 611	0	0
Iowa	[1] 1, 491, 647	49, 107	3. 3
Kansas	[1] 1, 151, 165	103, 923	9. 0
Kentucky	1, 824, 276	1, 278, 256	70. 1
Louisiana	1, 294, 276	720, 610	55. 7
Maine	477, 922	53, 275	11. 1
Maryland	677, 158	645, 171	95. 3
Massachusetts	476, 157	68, 458	14. 4
Michigan	1, 570, 672	494, 051	31. 5
Minnesota	[1] 1, 306, 337	48, 313	3. 7
Mississippi	1, 703, 291	667, 530	39. 2
Missouri	[1] 1, 770, 248	379, 464	21. 4
Montana	[1] 356, 570	35, 139	9. 9
Nebraska	892, 068	0	0
Nevada	[1] 56, 594	0	0
New Hampshire	199, 965	0	0
New Jersey	707, 758	0	0
New Mexico	322, 105	88, 703	27. 5
New York	2, 138, 746	278, 902	13. 0
North Carolina	2, 438, 680	1, 213, 679	49. 8
North Dakota	569, 929	0	0
Ohio	2, 154, 637	1, 330, 159	61. 7
Oklahoma	1, 597, 311	0	0
Oregon	483, 267	189, 195	39. 1
Pennsylvania	[1] 3, 097, 139	379, 607	12. 3
Rhode Island	61, 955	0	0
South Carolina	[1] 1, 367, 685	864, 312	63. 2
South Dakota	569, 258	10, 408	1. 8
Tennessee	[1] 1, 720, 018	880, 261	51. 2
Texas	3, 511, 780	186, 487	5. 3
Utah	243, 667	30, 195	12. 4
Vermont	[1] 240, 845	0	0
Virginia	1, 636, 612	533, 459	32. 6
Washington	697, 897	310, 015	44. 4
West Virginia	1, 276, 067	568, 191	44. 5
Wisconsin	[1] 1, 385, 163	0	0
Wyoming	160, 409	0	0
Total	54, 583, 385	15, 492, 585	28. 4

[1] 1930 census; no estimate made for Dec. 31, 1932.

Delaware leads in the percentage of rural population under whole-time health service, all of its three counties having been provided with local whole-time health organization by the State. Of the

States in which the local governmental units maintain the health organizations, with or without assistance from the State health department or other sources, Maryland, with 95.3, had the highest percentage of rural population under whole-time health service.

Of the 581 counties, townships, or districts with health service under local whole-time health officers at the end of the present calendar year, 551, or 94.8 percent, were receiving financial assist-

STATE	WHOLE-TIME COUNTY OR LOCAL DISTRICT HEALTH UNITS — JAN 1, 1929	1930	1931	1932	DEC 31, 1932	%
DELAWARE	3	3	3	3	3	100.0
MARYLAND	9	11	14	18	21	95.3
ALABAMA	50	51	54	54	54	85.7
KENTUCKY	39	45	43	81	79	70.1
SOUTH CAROLINA	20	23	23	24	24	63.2
OHIO	45	46	46	46	45	61.7
ARIZONA	3	3	6	5	4	56.3
LOUISIANA	29	31	31	32	31	55.7
TENNESSEE	23	38	42	43	41	51.2
NORTH CAROLINA	39	38	39	36	35	49.8
CALIFORNIA	11	12	13	14	14	48.4
WEST VIRGINIA	14	15	16	20	15	44.5
WASHINGTON	7	8	8	8	8	44.4
ARKANSAS	24	21	24	30	27	43.6
MISSISSIPPI	29	28	28	29	25	39.2
OREGON	7	7	8	8	7	39.1
VIRGINIA	16	17	26	27	25	32.6
MICHIGAN	3	4	24	25	29	31.5
GEORGIA	31	34	30	35	31	28.8
NEW MEXICO	7	7	8	6	6	27.5
MISSOURI	12	13	13	11	10	21.4
MASSACHUSETTS	1	1	1	3	3	14.4
NEW YORK	2	4	4	4	4	13.0
UTAH	3	3	2	2	2	12.4
PENNSYLVANIA	0	0	3	3	3	12.3
MAINE	4	4	4	6	5	11.1
CONNECTICUT	1	1	1	1	2	9.9
MONTANA	3	4	4	4	4	9.9
KANSAS	10	11	12	10	6	9.0
IDAHO	0	2	1	1	1	6.7
FLORIDA	3	2	3	2	3	6.3
TEXAS	4	6	7	9	8	5.3
MINNESOTA	1	1	1	1	1	3.7
IOWA	0	0	2	3	3	3.3
SOUTH DAKOTA	1	1	1	1	1	1.8
ILLINOIS	4	2	2	1	1	1.3
OKLAHOMA	10	9	9	9	0	0.0
COLORADO	1	1	1	1	0	0.0
WYOMING	1	0	0	0	0	0.0
TOTALS	470	507	557	616	581	28.4

FIGURE 2.—Number of whole-time county or local district health units, by States, 1929–32, and percentage of rural population served on December 31, 1932.

ance for the support of their health service from one or more of the following agencies: The State board of health, the United States Public Health Service, the Rockefeller Foundation, the American Red Cross, the American Women's Hospital Fund, the Rosenwald Fund, the Commonwealth Fund, and the Millbank Fund.

The accompanying chart (figure 2) shows, by States, the number of counties, townships, or districts with health service under

the direction of local whole-time health officers on January 1, 1929, 1930, 1931, and 1932, and on December 31, 1932, and the percentage of the rural population of each State receiving such service at the close of the calendar year 1932. Also, it shows the total number of counties, townships, or districts in the United States having local whole-time health service, together with the percentage of the rural population of the entire United States served by local whole-time health organizations.

It will be noted that 71 6 percent of our rural population is as yet not provided with the form of health organization which is considered best adapted to rural areas.

COURT DECISION RELATING TO PUBLIC HEALTH

Action to recover damages for injuries from lead poisoning held barred by statute of limitations.—(Arkansas Supreme Court; *Field* v. *Gazette Pub. Co.*, 59 S.W. (2d) 19; decided Mar. 27, 1933.) The plaintiff began working for the defendant publishing company as a linotype operator in January 1924. He continued in this employment until April 1926, at which time the malady from which he suffered first appeared. He received medical treatment and resumed work for various periods until July 1928, when he discontinued his employment. On June 10, 1929, the plaintiff brought action against the company, the complaint being that the defendant had been negligent in furnishing him an unsafe and dangerous place in which to work. It was the plaintiff's contention in the lower court that he had contracted lead poisoning during his employment with the defendant, which poisoning was the proximate cause of his injuries. One of the defenses was that the plaintiff's injury, if any, occurred prior to June 10, 1926, and the 3-year statute of limitations was pleaded specially in bar of plaintiff's right to recover. On the question of the statute of limitations, the trial court instructed the jury that "If you find that the plaintiff contracted the malady of which he complains previous to June 10, 1926, then you will find for the defendant." Verdict and judgment in the trial court were for the defendant, and plaintiff appealed.

On appeal, it was conceded on behalf of the plaintiff that, if the trial court's quoted instruction was correct, the case should be affirmed. The contention of the plaintiff, however, was that the statute of limitations was held in abeyance until he or his physicians determined the specific malady from which he was suffering and that this information was not obtained until sometime in 1928. The supreme court, however, said that, as it viewed the situation, "the great weight of American authority is to the effect that the cause of action arises and the statute of limitations begins to run from the

date of the negligent act and not from the time the full extent of the injury may be ascertained." It reached the conclusion that "the lower court made correct application of the 3-year statute of limitations and, therefore, did not commit error in giving the instructions complained of."

DEATHS DURING WEEK ENDED SEPT. 16, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Sept. 16, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	6,785	6,503
Deaths per 1,000 population, annual basis	9.5	9.3
Deaths under 1 year of age	450	569
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	41	47
Deaths per 1,000 population, annual basis, first 37 weeks of year	10.9	11.2
Data from industrial insurance companies:		
Policies in force	67,772,681	70,636,403
Number of death claims	11,835	12,516
Death claims per 1,000 policies in force, annual rate	9.1	9.3
Death claims per 1,000 policies, first 37 weeks of year, annual rate	9.9	9.7

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended September 23, 1933, and September 24, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 23, 1933, and Sept. 24, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Sept. 23, 1933	Week ended Sept. 24, 1932	Week ended Sept. 23, 1933	Week ended Sept. 24, 1932	Week ended Sept. 23, 1933	Week ended Sept 24, 1932	Week ended Sept. 23, 1933	Week ended Sept. 24, 1932
New England States:								
Maine		1					0	0
New Hampshire							0	0
Vermont							0	0
Massachusetts	8	19			19	20	0	3
Rhode Island	1	3			1	5	0	0
Connecticut	1	3	1	3	4	4	1	0
Middle Atlantic States:								
New York	32	49	[1] 6	[1] 7	53	49	1	7
New Jersey	8	36	4	4	5	44	4	0
Pennsylvania	22	62			18	46	2	3
East North Central States:								
Ohio	38	51	12		12	31	0	2
Indiana	47	61	33	26		11	1	4
Illinois	31	82	6	7	12	9	3	0
Michigan	12	13	1	1	10	26	1	0
Wisconsin	1	9	10	15	14	16	0	1
West North Central States:								
Minnesota	4	10		2	4	11	1	3
Iowa [2]	11	16				4	0	1
Missouri	44	63	12		6	1	0	2
North Dakota	6	2			7	5	0	0
South Dakota	4	2			3	3	0	0
Nebraska		11			1	10	0	0
Kansas	9	18		3	5	8	0	0
South Atlantic States:								
Delaware		6			2		0	0
Maryland [2,3]	7	20	5	11	3	3	1	0
District of Columbia	4	3		1	2	1	1	0
Virginia [4]	64	48			12	10	2	0
West Virginia	54	38	15	13	10	9	4	1
North Carolina [4]	117	67	44	5	39	16	1	1
South Carolina [3]	28	39	131	209	25	10	3	0
Georgia [3]	45	56		15	21	1	0	0
Florida [3]	5	24		1	3		0	0

See footnote at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 23, 1933, and Sept. 24, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Sept. 23, 1933	Week ended Sept. 24, 1932	Week ended Sept. 23, 1933	Week ended Sept. 24, 1932	Week ended Sept. 23, 1933	Week ended Sept. 24, 1932	Week ended Sept. 23, 1933	Week ended Sept. 24, 1932
East South Central States:								
Kentucky	78	81					1	1
Tennessee	65	103	14	7	3	1	0	3
Alabama [3]	56	80	10	8	20	1	0	1
Mississippi [2]	25	39					0	0
West South Central States:								
Arkansas	26	43	4	8	6		0	1
Louisiana	12	24	8	8	6	1	2	0
Oklahoma [5]	50	74	2	15	1	1	4	0
Texas [3]	83	86	107	43	15	1	2	1
Mountain States:								
Montana [4]	2	2	1		2	45	0	0
Idaho		13	2			2	0	1
Wyoming					1	2	0	0
Colorado	4	4			10	4	1	2
New Mexico	8	8			1	3	0	0
Arizona	3				1		0	0
Utah [2]	1				2	2	0	0
Pacific States:								
Washington	3	2			45	7	0	1
Oregon	3	1	5	6	9	31	0	0
California	31	49	27	252	119	18	3	2
Total	1,053	1,421	460	670	541	472	39	41

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Sept. 23, 1933	Week ended Sept. 24, 1932	Week ended Sept. 23, 1933	Week ended Sept. 24, 1932	Week ended Sept. 23, 1933	Week ended Sept. 24, 1932	Week ended Sept. 23, 1933	Week ended Sept. 24, 1932
New England States:								
Maine	15	5	7	9	0	0	2	13
New Hampshire	0	2	3	10	0	0	0	0
Vermont	1	0	1	2	0	0	0	0
Massachusetts	19	2	76	94	0	0	3	6
Rhode Island	1	0	15	12	0	0	0	0
Connecticut	10	0	15	20	0	0	4	5
Middle Atlantic States:								
New York	84	18	111	141	0	0	45	51
New Jersey	21	51	30	56	0	0	8	10
Pennsylvania	26	156	125	160	0	0	51	100
East North Central States:								
Ohio	20	0	149	176	0	11	51	61
Indiana	1	0	71	70	0	0	15	17
Illinois	12	8	136	155	0	5	27	49
Michigan	3	5	121	92	0	0	22	10
Wisconsin	2	2	27	25	4	0	0	6
West North Central States:								
Minnesota	36	2	38	37	0	0	2	9
Iowa [2]	5	1	19	20	0	2	4	7
Missouri	3	0	52	61	1	0	27	13
North Dakota	8	0	16	2	0	0	3	8
South Dakota	2	0	2	9	0	0	2	
Nebraska	1	0	19	21	0	0	3	1
Kansas	5	5	69	48	0	0	9	7
South Atlantic States:								
Delaware	0	0	4	6	0	0	1	4
Maryland [2 3]	4	2	17	28	0	0	13	31
District of Columbia	1	2	9	5	0	0	5	2
Virginia [4]	2	3	57	50	0	0	25	39
West Virginia	5	3	82	44	0	1	55	67
North Carolina [4]	2	2	57	70	0	0	16	21
South Carolina [3]	1	2	11	7	0	0	22	27
Georgia [3]	2	0	13	31	0	2	37	38
Florida [3]	0	0	3	4	0	0	3	7

See footnote at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 23, 1933, and Sept. 24, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Sept. 23, 1933	Week ended Sept. 24, 1932	Week ended Sept. 23, 1933	Week ended Sept. 24, 1932	Week ended Sept. 23, 1933	Week ended Sept. 24, 1932	Week ended Sept. 23, 1933	Week ended Sept. 24, 1932
East South Central States:								
Kentucky	0	2	91	86	0	0	47	98
Tennessee	0	2	43	56	0	0	38	40
Alabama [3]	0	2	49	67	0	0	20	19
Mississippi [2]	1	0	17	15	0	0	6	5
West South Central States:								
Arkansas	1	0	4	11	0	1	9	27
Louisiana	1	3	14	6	0	0	16	7
Oklahoma [5]	1	2	26	18	1	0	41	27
Texas [3]	0	0	26	35	1	0	48	36
Mountain States:								
Montana [4]	3	0	10	8	0	0	8	6
Idaho	0	0	2	2	1	0	0	1
Wyoming	3	0	1	2	0	0	1	1
Colorado	0	0	7	41	0	1	19	29
New Mexico	1	1	2	9	1	0	6	9
Arizona	0	1	5	2	0	0	2	3
Utah [2]	1	0	6	4	0	0	0	2
Pacific States:								
Washington	4	5	12	20	1	3	5	7
Oregon	2	1	14	6	1	0	8	1
California	4	3	116	62	3	4	6	5
Total	314	293	1,800	1,915	14	30	735	932

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, 58 cases, as follows: Maryland, 1; South Carolina, 1; Georgia, 13; Florida, 1; Alabama, 41; Texas, 1.
[4] Rocky Mountain spotted fever, 3 cases, as follows: Virginia, 1; North Carolina, 1; Montana, 1.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
August 1933										
Delaware	2	2			1		3	13	0	16
Idaho	1	1	3		2			9	1	11
Kansas	2	27	3	4	25		13	141	1	54
Maryland	2	20	17	2	18	1	7	77	0	100
Montana		9	5		9		8	20		30
Oklahoma [1]	1	55	19	191	15	17	8	20	0	122
Puerto Rico		66	45	4,464	96		0		3	50
Washington	5	4	9		25		7	74	6	24
West Virginia	4	114	60	1	66		19	109	8	214
Wisconsin	2	17	102		116		6	63	26	9

[1] Exclusive of Oklahoma City and Tulsa.

August 1933

	Cases
Chicken pox:	
Idaho	10
Kansas	15
Maryland	20
Montana	19
Oklahoma [1]	8
Puerto Rico	3
Washington	76
West Virginia	18
Wisconsin	119
Diarrhea:	
Maryland	50
Dysentery:	
Maryland	82
Oklahoma [1]	56
Puerto Rico	261
Washington	2
West Virginia	36
Filariasis:	
Puerto Rico	6
German measles:	
Kansas	2
Maryland	10
Montana	1
Washington	6
Wisconsin	8
Impetigo contagiosa:	
Kansas	5
Maryland	8
Montana	7
Washington	2
Leprosy:	
Puerto Rico	1
Lethargic encephalitis:	
Idaho	2
Kansas	27
Maryland	1
Montana	2
Oklahoma [1]	2
Washington	2
West Virginia	5
Wisconsin	5

August 1933—Continued

	Cases
Mumps:	
Delaware	1
Kansas	83
Maryland	38
Montana	1
Puerto Rico	27
Washington	57
Wisconsin	50
Ophthalmia neonatorum:	
Oklahoma [1]	2
Puerto Rico	9
Paratyphoid fever:	
Kansas	4
Washington	1
Puerperal septicemia:	
Puerto Rico	5
Rabies in animals:	
Maryland	3
Washington	5
Rabies in man:	
Washington	1
Rocky Mountain spotted fever:	
Maryland	5
Montana	1
Scabies:	
Maryland	2
Montana	6
Oklahoma [1]	2
Septic sore throat:	
Idaho	3
Kansas	1
Maryland	6
Oklahoma [1]	22
Tetanus:	
Kansas	4
Maryland	4
Puerto Rico	17
Tetanus, infantile:	
Puerto Rico	17

August 1933—Continued

	Cases
Trachoma:	
Kansas	1
Montana	2
Oklahoma	6
Puerto Rico	1
Washington	1
Tularaemia:	
Kansas	2
Typhus fever:	
Maryland	2
Undulant fever:	
Idaho	6
Kansas	4
Maryland	2
Montana	2
Washington	2
Wisconsin	7
Vincent's angina:	
Kansas	11
Maryland	12
Montana	1
Oklahoma [1]	2
Washington	3
Whooping cough:	
Delaware	10
Idaho	6
Kansas	199
Maryland	327
Montana	120
Oklahoma [1]	8
Puerto Rico	160
Washington	128
West Virginia	99
Wisconsin	1,338
Yaws:	
Puerto Rico	9

LETHARGIC ENCEPHALITIS, ST. LOUIS, MO.[2]

A report dated September 25, 1933, stated that since July 31, 1933, there had been 455 cases of lethargic encephalitis in St. Louis City, Mo., with 95 deaths and 491 cases with 78 deaths in the county of St. Louis. Only 14 cases had been reported in both areas during the preceding 48 hours.

WEEKLY REPORTS FROM CITIES

City reports for week ended Sept. 16, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0		1	0	2	0	0	0	1	10	27
New Hampshire:											
Concord	0		0	0	0	0	0	0	0	0	7
Vermont:											
Barre	0		0	0	0	0	0	1	0	0	4
Burlington	0		0	0	0	1	0	0	0	0	5
Massachusetts:											
Boston	4		0	7	6	13	0	7	1	44	156
Fall River	2		0	0	0	3	0	1	0	0	25
Springfield	0		0	0	0	1	0	1	1	5	24
Worcester	5	1	0	10	8	4	0	2	0	10	41

[1] Exclusive of Oklahoma City and Tulsa.
[2] For other reports of lethargic encephalitis see table above and p. 1246.

City reports for week ended Sept. 16, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Rhode Island:											
Pawtucket	0	---	0	0	0	0	0	0	0	0	14
Providence	1	---	0	0	0	7	0	1	1	44	42
Connecticut:											
Bridgeport	0	---	0	1	0	0	0	2	0	1	19
Hartford	0	---	0	0	1	3	0	0	0	2	34
New Haven	2	1	0	0	2	0	0	0	1	1	27
New York:											
Buffalo	0	---	0	3	9	4	0	8	4	29	120
New York	31	5	4	14	69	32	0	73	21	161	1,191
Rochester	0	---	0	0	1	3	0	1	0	12	47
Syracuse	0	---	0	0	0	2	0	0	0	7	35
New Jersey:											
Camden	2	---	0	0	2	2	0	0	1	0	15
Newark	1	2	0	0	3	2	0	8	0	31	66
Trenton	0	1	0	2	0	0	0	0	[1] 1	1	35
Pennsylvania:											
Philadelphia	0	3	2	7	16	20	0	24	4	15	373
Pittsburgh	1	---	0	2	9	5	0	6	0	46	111
Reading	0	---	0	0	0	2	0	0	0	2	13
Ohio:											
Cincinnati	3	1	1	0	2	2	0	10	4	2	90
Cleveland	5	27	0	1	8	9	0	14	2	58	163
Columbus	2	1	1	0	2	11	0	4	3	5	67
Toledo	0	---	0	0	6	7	0	4	1	5	69
Indiana:											
Fort Wayne	2	---	0	0	0	0	0	0	0	0	14
Indianapolis	0	---	0	0	6	4	0	6	1	3	---
South Bend	0	---	0	0	0	0	0	1	0	0	14
Terre Haute	0	---	0	0	1	1	0	1	0	0	22
Illinois:											
Chicago	1	1	4	8	30	41	0	36	3	27	672
Springfield	---	---	---	---	---	---	---	---	---	---	---
Michigan:											
Detroit	5	1	0	2	5	19	0	11	0	51	161
Flint	1	---	0	0	1	1	0	1	0	0	12
Grand Rapids	0	---	0	0	0	0	0	1	0	3	26
Wisconsin:											
Kenosha	0	---	0	0	0	0	0	0	0	5	7
Madison	0	---	0	0	0	2	0	0	0	24	8
Milwaukee	0	---	0	2	3	8	0	2	1	90	72
Racine	0	---	0	1	0	0	0	0	0	6	12
Superior	0	---	0	3	0	0	0	0	0	9	7
Minnesota:											
Duluth	0	---	0	2	2	2	0	0	0	3	13
Minneapolis	4	---	0	0	1	4	0	2	1	12	82
St. Paul	0	---	0	0	2	2	0	1	0	13	50
Iowa:											
Des Moines	5	---	0	0	0	3	0	0	0	0	30
Sioux City	0	---	---	0	---	2	0	---	1	1	---
Waterloo	0	---	0	0	0	0	0	0	0	2	---
Missouri:											
Kansas City	3	---	0	0	4	8	0	4	1	2	77
St. Joseph	2	---	0	1	1	1	0	0	0	0	18
St. Louis	2	---	0	7	4	5	0	10	2	6	254
North Dakota:											
Fargo	0	---	0	4	1	0	0	0	0	3	5
Grand Forks	0	---	0	0	0	0	0	0	0	0	---
South Dakota:											
Aberdeen	0	---	0	0	0	0	0	0	0	0	---
Sioux Falls	0	---	0	0	0	0	0	0	0	0	7
Nebraska:											
Omaha	1	---	0	4	1	1	0	1	1	7	47
Kansas:											
Topeka	0	---	0	1	1	1	0	0	1	2	15
Wichita	1	---	0	1	1	1	0	1	0	3	22
Delaware:											
Wilmington	1	---	0	0	1	1	0	0	0	0	20
Maryland:											
Baltimore	0	1	0	0	11	8	0	9	1	56	162
Cumberland	1	---	0	0	0	0	0	1	0	0	7
Frederick	0	---	0	0	0	1	0	0	0	0	1
District of Col.:											
Washington	6	---	0	3	3	2	0	10	3	7	128

[1] Nonresident.

City reports for week ended Sept. 16, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Virginia:											
Lynchburg	------	------	------	------	------	------	------	------	------	------	------
Richmond	2	------	0	0	1	5	0	2	1	6	46
Roanoke	2	------	0	0	0	1	0	0	1	0	7
West Virginia:											
Charleston	2	------	0	0	2	0	0	1	0	1	14
Huntington	1	------	0	0	0	2	0	0	0	0	------
Wheeling	0	------	0	0	1	0	0	1	1	5	16
North Carolina:											
Raleigh	1	------	0	0	0	1	0	1	0	0	13
Wilmington	1	------	0	0	3	0	0	0	0	0	15
Winston-Salem	3	------	0	0	0	1	0	0	0	------	15
South Carolina:		2									
Charleston	0	2	0	0	2	0	0	3	2	0	29
Columbia	0	------	0	0	1	0	0	4	0	0	26
Greenville	1	------	0	0	0	0	0	1	2	0	11
Georgia:											
Atlanta	10	1	1	2	3	4	0	6	0	3	77
Brunswick	0	------	0	0	0	0	0	0	0	0	3
Savannah	0	------	0	3	0	0	0	0	1	0	27
Florida:											
Miami	0	------	0	0	1	0	0	3	0	5	26
Tampa	2	------	0	0	0	0	0	1	0	0	25
Kentucky:											
Ashland	0	------	0	0	0	1	0	0	2	14	------
Lexington	1	------	0	1	1	0	0	1	0	1	14
Louisville	4	1	1	0	5	7	0	2	6	3	93
Tennessee:											
Memphis	10	------	0	1	5	3	0	6	4	10	81
Nashville	2	------	1	0	0	1	0	0	2	1	37
Alabama:											
Birmingham	7	------	0	0	5	1	0	3	2	1	52
Mobile	0	------	0	0	0	0	0	1	1	0	21
Montgomery	1	------	0	0	0	2	0	0	0	0	------
Arkansas:											
Fort Smith	1	------	0	0	0	1	0	0	0	3	------
Little Rock	0	------	0	0	0	0	0	1	0	2	------
Louisiana:											
New Orleans	7	1	1	0	6	3	0	13	2	4	141
Shreveport	4	------	0	0	0	0	0	5	0	1	32
Oklahoma:											
Tulsa	1	------	0	0	0	0	0	0	1	6	------
Texas:											
Dallas	9	------	0	0	5	1	0	2	0	2	63
Fort Worth	1	------	0	0	1	3	0	1	2	1	27
Galveston	0	------	0	0	0	1	0	0	0	0	14
Houston	8	------	0	0	6	3	0	2	0	0	59
San Antonio	0	------	1	0	2	0	0	1	1	0	36
Montana:											
Billings	------	------	------	------	------	------	------	------	------	------	------
Great Falls	0	------	0	1	0	2	0	0	1	10	3
Helena	0	------	0	0	0	0	0	0	0	0	3
Missoula	0	------	0	0	1	0	0	0	1	0	5
Idaho:											
Boise	0	------	0	0	0	0	0	0	0	0	4
Colorado:											
Denver	2	16	0	1	6	6	0	6	2	15	75
Pueblo	0	------	0	0	1	1	0	1	0	0	8
New Mexico:											
Albuquerque	1	------	0	0	0	0	0	2	1	1	9
Utah:											
Salt Lake City	0	------	1	4	2	1	0	1	1	11	18
Nevada:											
Reno	0	------	0	0	0	0	0	0	0	0	4
Washington:											
Seattle	0	------	0	1	3	3	0	3	0	14	73
Spokane	0	------	------	0	------	1	0	------	0	0	------
Tacoma	0	------	0	1	1	1	0	1	0	2	26
Oregon:											
Portland	1	------	0	1	2	5	0	0	0	1	40
Salem	0	2	0	0	0	0	0	0	0	0	------
California:											
Los Angeles	10	12	0	7	5	20	7	27	2	33	280
Sacramento	1	------	0	1	3	5	0	4	4	15	28
San Francisco	1	3	1	2	7	9	0	14	0	14	178

City reports for week ended Sept. 16, 1933—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Iowa:			
Boston	0	0	10	Des Moines	0	0	1
Fall River	0	0	1	Missouri:			
Worcester	0	0	2	St. Joseph	0	0	2
Connecticut:				North Dakota:			
Bridgeport	0	0	1	Fargo	0	0	1
Hartford	0	0	1	Nebraska:			
New York:				Omaha	1	0	0
New York	1	0	81	Delaware:			
Rochester	0	0	4	Wilmington	1	1	0
Syracuse	0	0	2	District of Columbia:			
New Jersey:				Washington	0	0	2
Camden	0	0	1	Virginia:			
Newark	0	0	5	Richmond	0	0	1
Trenton	0	0	1	West Virginia:			
Pennsylvania:				Wheeling	0	0	1
Philadelphia	0	2	0	North Carolina:			
Pittsburgh	0	0	3	Winston-Salem	1	0	0
Ohio:				Georgia:			
Cincinnati	0	0	1	Atlanta	1	0	0
Cleveland	0	0	7	Kentucky:			
Indiana:				Louisville	0	0	2
Indianapolis	1	0	0	Alabama:			
Illinois:				Birmingham	0	0	1
Chicago	2	1	13	Texas:			
Michigan:				Dallas	1	0	0
Detroit	0	0	4	Utah:			
Wisconsin:				Salt Lake City	0	0	1
Milwaukee	0	0	1	Washington:			
Racine	0	1	0	Tacoma	0	0	2
Minnesota:				Oregon:			
Duluth	0	0	3	Portland	0	0	2
Minneapolis	0	0	3	California:			
St. Paul	0	0	1	Los Angeles	1	2	2

Lethargic encephalitis.—Cases: Buffalo, N.Y., 1; New York, 6; Philadelphia, 1; Pittsburgh, 2; Cleveland, 6; Detroit, 5; Grand Rapids, 2; Sioux City, Iowa, 4; Kansas City, Mo., 8; St. Joseph, 0; St. Louis, 171; Omaha, 4; Ashland, Ky., 7; Houston, Tex., 1; Pueblo, Colo., 1; Salt Lake City, 1.

Pellagra.—Cases: Baltimore, 2; Charleston, S.C., 1; Atlanta, 1; Memphis, 1; Birmingham, 1; Dallas, Tex., 2.

Typhus fever.—Cases: Savannah, 5; Houston, Tex., 2; San Antonio, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—Two weeks ended September 9, 1933.—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the 2 weeks ended September 9, 1933, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis					1		1			2
Chicken pox		3		19	58	17	20	1	18	136
Diphtheria		3	2	29	11	8	3			56
Dysentery				6	14		1			21
Erysipelas				7	2			2	2	13
Influenza				1		1	1		21	24
Lethargic encephalitis					2				1	3
Measles		1		72	8	2	3	4	4	94
Mumps					30	1	2	1	2	36
Paratyphoid fever					17	2				19
Pneumonia		1			5		6		3	15
Poliomyelitis		1		19	4	1	4	3		32
Scarlet fever		15	4	45	48	21	9	1	24	167
Smallpox							1			1
Trachoma					19		1		32	52
Tuberculosis	1		10	141	115	2	27	1	32	329
Typhoid fever			10	85	33	5	5	4	5	147
Undulant fever				1	8					9
Whooping cough		11	5	147	261	108	54	15	54	655

Ontario Province—Communicable diseases—Four weeks ended August 26, 1933.—The Department of Health of the Province of Ontario, Canada, reports certain communicable diseases for the 4 weeks ended August 26, 1933, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	1	1	Puerperal septicemia		1
Chicken pox	133		Scarlet fever	68	
Diphtheria	30	2	Septic sore throat	1	
Erysipelas	4		Syphilis	71	
German measles	2		Trachoma	15	
Gonorrhea	76		Trichinosis	1	
Influenza		5	Tuberculosis	136	31
Measles	25		Tularaemia	1	
Mumps	66		Typhoid fever	62	2
Paratyphoid fever	39	1	Undulant fever	9	
Pneumonia		38	Whooping cough	584	7
Poliomyelitis	13				

Vital statistics—First quarter 1933.—The Bureau of Statistics of the Dominion of Canada has published statistics for the months of January, February, and March 1933. The rates are computed on an

annual basis. There were 21.2 live births per 1,000 population during the quarter in 1933 and 23.1 per 1,000 in 1932. The death rate was 10.8 per 1,000 population for the first quarter of each year. The infant mortality for the quarter was 84.9 per 1,000 live births in 1933 and 74.0 in 1932. The maternal death rate was 4.9 per 1,000 live births in the first quarter of 1933 and 5.4 in the corresponding quarter of 1932.

The accompanying tables give the numbers of births, deaths, and marriages and deaths from certain causes by Provinces for the first quarter of 1933:

Numbers of births, deaths, and marriages

Province	Live births	Deaths (exclusive of stillbirths)	Deaths under 1 year of age	Maternal deaths	Marriages
Canada [1]	55,646	28,248	4,723	275	10,546
Prince Edward Island	480	293	42	-------	82
Nova Scotia	2,791	1,800	261	12	606
New Brunswick	2,553	1,470	244	17	359
Quebec	19,259	8,585	2,012	103	2,295
Ontario	15,938	9,763	1,019	85	3,791
Manitoba	3,470	1,525	265	18	789
Saskatchewan	5,076	1,743	431	17	1,022
Alberta	3,703	1,429	312	17	908
British Columbia	2,376	1,640	137	6	694

[1] Exclusive of Yukon and the Northwest Territories.

Deaths from certain causes in Canada for the first quarter of 1932 and 1933, and by Provinces for the first quarter 1933

Cause of death	Canada [1] (first quarter)		Province—First quarter 1933								
	1932	1933	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Automobile accidents	191	145	-------	5	5	36	68	3	3	5	20
Cancer	2,566	2,568	20	167	120	663	964	160	125	137	212
Diarrhea and enteritis	581	526	5	8	12	330	78	21	27	30	15
Diphtheria	139	66	-------	1	2	36	12	3	7	4	1
Diseases of the arteries	1,865	1,887	24	113	60	356	962	113	61	68	130
Diseases of the heart	4,121	4,148	24	233	169	1,005	1,518	210	196	178	315
Homicides	46	34	-------	4	-------	14	7	4	3	1	1
Influenza	1,382	2,580	33	193	165	787	798	177	234	136	63
Measles	111	48	-------	7	7	12	17	1	-------	4	-------
Nephritis	1,564	1,430	16	82	58	576	464	52	70	53	59
Pneumonia	2,309	2,362	28	199	167	700	718	151	162	127	80
Poliomyelitis	18	15	-------	-------	-------	6	2	3	-------	3	1
Puerperal causes	320	275	-------	12	17	103	85	18	17	17	6
Scarlet fever	67	58	1	3	3	27	16	1	4	2	1
Smallpox	16	2	-------	-------	-------	-------	-------	-------	-------	-------	2
Suicides	209	202	-------	6	4	28	87	14	20	13	30
Tuberculosis	1,886	1,803	19	120	100	765	383	120	70	91	135
Typhoid fever	68	42	-------	-------	5	20	4	5	3	3	2
Violent deaths	911	843	9	64	42	160	322	42	74	61	69

[1] Exclusive of Yukon and the Northwest Territories.

CUBA

Habana—Communicable diseases—Four weeks ended September 9, 1933.—During the 4 weeks ended September 9, 1933, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths
Diphtheria	3	1
Malaria	11	
Measles	1	1
Tuberculosis	14	4
Typhoid fever	16	10

Cienfuegos—Typhoid fever.—According to a recent report there was an epidemic of typhoid fever in Cienfuegos, Cuba. Ten new cases, with 2 deaths, were reported during the week ended September 2, and 21 new cases with 2 deaths were reported for the week ended September 16. On the date of the report, September 19, 1933, it was stated that there were 150 cases of typhoid in the city. The outbreak was thought to have been caused by water.

JAMAICA

Communicable diseases—Four weeks ended September 9, 1933.—During the 4 weeks ended September 9, 1933, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island of Jamaica, outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox		8	Lethargic encephalitis		1
Diphtheria	1	1	Puerperal fever		1
Dysentery	5	12	Tuberculosis	41	76
Erysipelas		2	Typhoid fever	19	91
Leprosy	1	1			

STRAITS SETTLEMENTS

Singapore—Vital statistics.—During the year 1932, births, deaths, and deaths from certain diseases were reported in Singapore, Straits Settlements, as follows:

Population (estimated)	470, 271
Number of deaths	9, 480
Death rate per 1,000 population	20. 12
Infant mortality per 1,000 births	180. 2
Number of births	16, 589
Deaths from—	
Beriberi	509
Cancer	204
Diabetes	47
Diarrhea and enteritis	684
Deaths from—Continued	
Diseases of early infancy	603
Dysenteries	382
Infantile convulsions	786
Malaria (many nonresidents)	463
Nephritis, acute	77
Pneumonia and bronchitis	1, 539
Syphilis	200
Tuberculosis	1, 088
Typhoid fever	58

Cases of certain communicable diseases were reported in Singapore during 1932 as follows:

Disease	Cases	Disease	Cases
Cerebrospinal fever	6	Puerperal fever	16
Chicken pox	542	Scarlet fever	1
Diphtheria	124	Smallpox	8
Erysipelas	2	Typhoid fever	114
Paratyphoid fever	1		

CHOLERA. PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Sept. 29, 1933, pp. 1189–1217. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Oct. 27, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

China—Hankow.—During the week ended September 9, 1933, 1 case of cholera was reported in Hankow, China.

Philippine Islands.—During the week ended September 23, 1933, cholera was reported in the Philippine Islands as follows: Cebu province, Barili, 4 cases, 2 deaths; Cebu city, 2 cases, 2 deaths; Olango Island, 2 cases, 2 deaths; Talisan, 3 cases, 3 deaths; Occidental Misamis province, Oroquieta, 1 case, 1 death.

Plague

Azores—St. Michael's—Ponta del Gada.—During the week ended September 23, 1933, 2 cases of plague with 1 death were reported in Ponta del Gada, St. Michael's, Azores.

China—Manchuria.—Under date of September 21, 1933, plague in epidemic form has been reported in Taonan, Nungan, and Tungchowliao districts, Manchuria.

India—Rangoon.—During the week ended September 16, 1933, 2 cases of plague were reported in Rangoon, India.

Yellow fever

Senegal—Bakel.—During the week ended September 23, 1933, 2 deaths from yellow fever were reported in Bakel, Senegal.

x

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Quarantinable and Other Diseases in Foreign Countries

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of public health.

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SICKNESS AND THE ECONOMIC DEPRESSION[1]

Preliminary Report on Illness in Families of Wage Earners in Birmingham, Detroit, and Pittsburgh

By G. St. J. Perrott, *Consultant in Vital Statistics;* Selwyn D. Collins, *Senior Statistician, United States Public Health Service;* and Edgar Sydenstricker, *Director of Research, Milbank Memorial Fund*

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What effect is the economic depression having upon the health of the American people?

The indices of health, or rather of ill health, upon which we ordinarily rely have pointed so far to a condition that is surprising to many. After several years of severe economic stress, the gross death rate has attained the lowest level on record. Infant and tuberculosis mortality have not increased in the country as a whole; on the contrary, they have continued to decline. These encouraging indications have led to considerable speculation on the part of some as to the possible advantages of "tightening the belt" during hard times, of returning to "simpler and saner living", of the "toughening" regimen of adversity. Others have offered the explanation that any ill effects have been prevented by a marvelously efficient public health system and program of social relief, and are concerned chiefly over the possibility of a breakdown in these efforts before necessary economic readjustments can be completed.

[1] From the Office of Statistical Investigations, United States Public Health Service, and the Division of Research, Milbank Memorial Fund. This study was made also in cooperation with the international inquiry being carried out in various countries under the general auspices of the Health Organization of the League of Nations, the American committee being composed of Edgar Sydenstricker, Milbank Memorial Fund; Louis I. Dublin, Metropolitan Life Insurance Co.; Walter F. Willcox, Cornell University; and Selwyn D. Collins, U.S. Public Health Service.

The cooperation of local health officers and others in each locality who assisted in the surveys is gratefully acknowledged.

A large part of this paper appears also in the Quarterly Bulletin of the Milbank Memorial Fund for October 1933.

Whatever may be the reasons for a low death rate during an unusually severe economic depression, the fact that the death rate has continued on a low level must be accepted as a most encouraging sign. It is indubitable evidence that, up to this time, unemployment, diminished purchasing power, altered standards of living, and even privation have not *killed* very many of the population. But this indication should be accepted only insofar as it really is a sign of good health. The death rate is not an adequate criterion of the extent of sickness and impairment. It is not affected immediately by unfavorable living conditions unless starvation and pestilence are actually present. It does not promptly reveal decreased resistance to disease. It is not an accurate measure, for example, of malnutrition. Furthermore, the gross mortality rate for the Nation as a whole or for any large group of the population does not tell whether or not certain elements of the population are suffering from ill health; the actual increase in illness and mortality among that fraction which has been reduced to poverty by the depression may be masked by the general downward trend of the mortality among the more fortunate and larger moiety of the population. In fact, fragmentary information already gives a hint of warning that, in certain areas and among certain classes of the population, the situation is not nearly so favorable as gross mortality rates appear to show. Malnutrition among school children apparently has increased, in some localities at least. Higher infant mortality and tuberculosis death rate have been experienced in certain areas of New York City where unemployment was most serious. Signs of an increase in the number of cases of mental disease are not lacking. Already there is some evidence that the sickness rate has risen among the unemployed population, especially where social relief has been unequal to the situation.

These indications of an unfavorable tenor, as well as the obvious desirability of appraising the situation as accurately as possible, led the United States Public Health Service to make an inquiry into the prevalence of sickness and malnutrition and into changes in economic status and standards of living in sample populations that are known to be seriously affected by unemployment.

METHOD AND SCOPE OF THE INVESTIGATION

The investigation obtained records of illness for a 3-month period in 1933 and an income and employment record for 4 years for some 12,000 families in 10 cities by house-to-house canvass. In addition, a study of diet and housing conditions was made among a small group of families in each surveyed city, and school children in enumerated families were examined in two of the cities. The present paper includes only provisional sickness data in three of the canvassed cities—Birmingham, Detroit, and Pittsburgh.

Selection of cities.—Large cities were selected for the survey, with two exceptions, because unemployment and the privation incident to unemployment were known to be greater in the large cities. Eight cities were included, as follows: Detroit, Cleveland, Pittsburgh, Syracuse, New York, Brooklyn, Baltimore, Birmingham. In addition, a survey was made in a number of coal mining camps in the vicinity of Morgantown, W.Va., and in cotton mill villages near Greenville, S.C.

Selection of areas within the cities.—Districts were selected in the poorer sections of the cities. Well-to-do sections were disregarded because the dwellers in these areas, however much their incomes may have decreased, were presumably living above any scale that might involve deprivation of the things necessary to health. On the other hand, slum areas were also avoided. The desired sample of the population was one which contained a high percentage of individuals able and willing to work but in which unemployment was high at the time of the canvass.

Living side by side with these families of the unemployed, there were other families who, even in these poor districts, were still in reasonably comfortable circumstances, that is, had adequate food, clothing, and shelter. These "comfortable" families serve as a control group whose illness record can be compared with that of families in a state of comparative poverty for 1 or more years prior to the survey. It should be emphasized that in the selected districts every family was included unless the information was refused, and refusals were exceedingly rare.

Nature of information obtained.—The information called for on the schedule included (*a*) occupation, income, and regularity of employment of each wage earner for each year from 1929 to 1932, (*b*) nativity, racial stock, and education of husband and wife, (*c*) a complete census of the household, with birth date, sex, and marital status of each member, and (*d*) illness of each member during the three months prior to the enumerator's visit, together with the extent of medical, hospital, nursing, and dental care received.

Method of obtaining the information.—For each city a local supervisor was assigned from the Public Health Service or the Milbank Memorial Fund. The supervisors were already experienced in the collection and tabulation of data of the kind here considered, but to secure accuracy and uniformity they were given an intensive training in the meaning of the items on the schedule and the method of recording the data.

Enumerators were hired locally. It was possible to secure very capable men and women for the work, many of them having had previous experience in surveys for social service groups and relief organizations. The enumerators were given a preliminary period of training in order to make them familiar with the schedule and were

taken by the local supervisor to interview several families before making any visits alone. Enumerators were instructed and encouraged to be thorough rather than rapid in their work.

Both the supervisor and the enumerators worked under written instructions so that the surveys would be done in as comparable a manner as possible in all cities. In addition, one of us (G. S. P.) acted as general supervisor and visited all but two of the communities either to start the work (select districts, enumerators, etc.) or to check the selections made by the local supervisor.

THE POPULATION SURVEYED

Number.—In the three cities included in this preliminary paper, schedules were obtained from about 3,500 white families. The families here considered are those for which the employment and wage record and other income facts were sufficiently complete to permit computing of exact incomes for each year from 1929 to 1932 and for which other information was reasonably complete. There were 2,566 such families including 11,330 individuals.

Occupational composition.—The population was largely of the wage-earning class. The usual occupation of the chief wage earner in 1929 was that of skilled laborer in 59 percent of the families; unskilled, 19 percent; clerical and salesmen, 13 percent; dealers, merchants, etc., 7 percent; professional, 2 percent. In 1932, in 18 percent of the families the chief wage earner was without employment throughout the year.

Considering all the wage earners in the family, in 1929 only 1 percent of the families had no employed workers, 16 percent had only part-time workers, and 83 percent had one or more full-time workers.[2] In 1932 the percentages were 12 percent no employed workers, 40 percent part-time workers only, and 48 percent full-time workers.[3] The same downward change is evident here as in the per capita and family income, one, of course, being the cause of the other.

Nativity and racial stock.—In nearly 54 percent of the families the head of the household was native white of native parents, in 14 percent of foreign or mixed parents, and in 32 percent foreign born. The racial stock of the group of foreign or mixed parents was largely English, Irish, and German, while that of the foreign-born group was more evenly distributed between English, Irish, German, Polish, Italian, and Slavic.

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[2] Includes 2 percent of families whose wage earner was living on income or pension.

[3] Includes 3 percent of families whose wage earner was living on income or pension.

ECONOMIC HISTORY OF FAMILIES

Meaning of "Income."—Income as computed in this study includes all receipts from any source—salary, royalties, interest, pension, savings, borrowed funds, gifts, and public and private relief. In the case of families given a weekly food ticket from welfare institutions, its value was included in the family income. Free or unpaid rent was not included because of incomplete data on this item.

Family incomes 1929 and 1932.—No attempt was made to select districts in which the income distribution of the surveyed families would be representative of the cities as a whole. The plan, as already outlined, was to include sections having families who in normal times were in moderate circumstances, but who in large numbers had been reduced to poverty or near poverty during the depression. A rough idea of the income distribution of the surveyed group in 1929 and 1932 as compared with large cities and the entire United States may be obtained from table 1.

It will be seen that even in 1929 the surveyed population as compared with the total population of large cities contained a considerable excess of families below $1,200 in annual income (25 percent as compared with 7 percent) and a deficiency of families over $3,000 (18 percent as compared with 39 percent). The closer agreement with the estimate for the United States in 1928 is simply fortuitous. The total population of the United States contains a larger proportion of low incomes than the population in cities of 100,000 or more inhabitants because of the dwellers in small towns and rural areas, where money income and the general level of prices are lower. Negroes are also a low income group that live largely in rural areas.

The table shows also the tremendous drop in income experienced by the surveyed population from 1929 to 1932. In 1932, 69 percent of the families received incomes less than $1,200 per year, as compared with 25 percent in 1929. Only 9 percent of the families had incomes over $2,000 in 1932 as compared with 40 percent in 1929.

TABLE 1.—*Percentage distribution according to total income of families (1) in the surveyed population for 1929 and 1932, (2) as estimated for all cities of 100,000 and over, and (3) as estimated for the United States*

Total family income per annum	Surveyed group in Birmingham, Detroit, and Pittsburgh		Cities of 100,000 and over in United States, 1928–31[1]	United States, 1928[2]
	1929	1932		
Under $1,200	25.2	69.3	7	21.3
$1,200, but under $2,000	34.5	21.6	27	34.0
$2,000, but under $3,000	22.7	7.0	27	21.5
$3,000 and over	17.6	2.1	39	23.2
All income	100.0	100.0	100	100.0

[1] I. S. Falk, Margaret C. Klem, and Nathan Sinai: The Incidence of Illness and the Receipt and Costs of Medical Care among Representative Families. Publication No. 26, Committee on the Costs of Medical Care.

[2] Louis S. Reed: The Ability to Pay for Medical Care. Publication No. 25, Committee on the Costs of Medical Care.

Per capita income changes.—For the purposes of this investigation family income per capita was used as the basis of classifying the households because it was felt that this represented economic status better than the total family income, which takes no account of size of family. It was realized that for strict accuracy a figure taking account not only of the size of the family but also the age and sex of its members, such as "income per adult male unit", might be better than income per capita. However, previous studies have shown excellent correlation between per capita income and these other derived units. It was felt that the accuracy of the 4-year income record might not be sufficient to justify the more refined calculations.

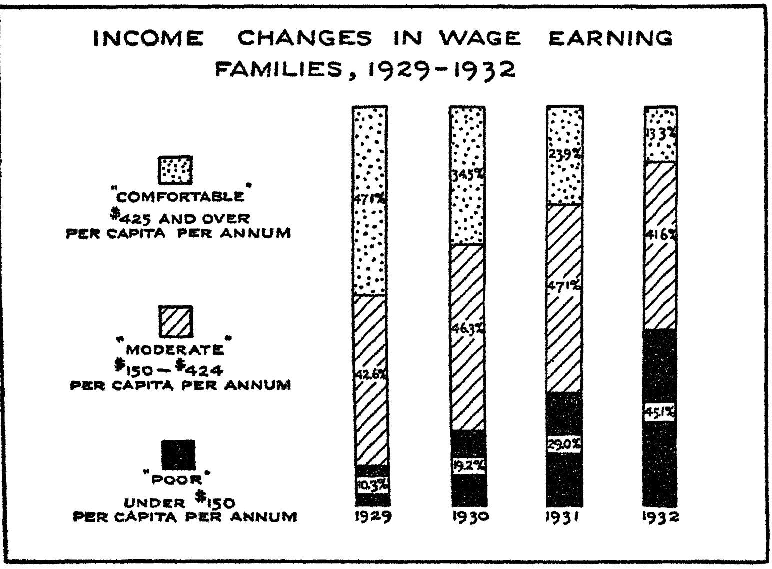


FIGURE 1.—Percentage distribution of the surveyed population according to annual family income per capita for each of the years 1929–32. The population includes 11,330 individuals in 2,566 families in Birmingham, Detroit, and Pittsburgh.

Table 2 and figure 1 show the population grouped according to annual per capita income for the years 1929 to 1932. For convenience in discussion the individual income classes have been combined into three groups and designated as follows:

Poor: Under $150 per capita per year.

Moderate: $150 to $424 per capita per year.

Comfortable: $425 and over per capita per year.

These designations have no significance other than as convenient labels indicating a rising scale of per capita income.

It will be seen that the "poor" group (income less than $150 per capita), which constituted only 10 percent of the total in 1929, was 45 percent in 1932, while the "comfortable" group ($425 or more per

capita) dropped from 47 percent of the total in 1929 to 13 percent in 1932. The percentage in the "moderate" class ($150 to $424) did not change greatly. This does not mean that individuals in this group in 1929 suffered no diminution in income during succeeding years, but that as some dropped into the low income group others from the higher class took their places.

TABLE 2.—*Distribution of the surveyed population according to annual family income per capita for the years 1929 to 1932, Birmingham, Detroit, Pittsburgh*

Annual family income per capita	1929		1930		1931		1932	
	Number of persons	Percentage	Number of persons	Percentage	Number of persons	Percentage	Number of persons	Percentage
"Poor"		10.3		19.2		29.0		45.1
Under $50	123	1.1	338	3.0	657	5.8	1,366	12.1
$50 to $99	401	3.5	925	8.2	1,426	12.6	2,236	19.7
$100 to $149	645	5.7	912	8.0	1,197	10.6	1,506	13.3
"Moderate"		42.6		46.3		47.1		41.6
$150 to $199	726	6.4	1,052	9.3	1,442	12.7	1,312	11.6
$200 to $249	882	7.8	861	7.6	1,121	9.9	1,178	10.4
$250 to $299	917	8.1	1,027	9.2	926	8.2	815	7.2
$300 to $349	1,068	9.4	1,062	9.3	901	7.9	717	6.3
$350 to $424	1,230	10.9	1,241	10.9	949	8.4	693	6.1
"Comfortable"		47.1		34.5		23.9		13.3
$425 to $499	1,200	10.6	880	7.8	708	6.3	506	4.5
$500 to $749	2,390	21.1	1,876	16.5	1,363	12.0	709	6.2
$750 and over	1,748	15.4	1,156	10.2	640	5.6	292	2.6
Total	11,330	100.0	11,330	100.0	11,330	100.0	11,330	100.0

The change from one income class to another is better shown in figure 2, where the income history of the three groups of individuals in 1929 is traced through each year to 1932. It is seen that only about one fourth of the individuals in families economically comfortable in 1929 retained that status in 1932, and nearly an equal number had become "poor." Over half of those in moderate circumstances in 1929 had fallen into the "poor" category by 1932. Nine out of ten persons classified as "poor" in 1929 remained in that class throughout the period. Obviously very few persons enjoyed an increasing income during the depression and a very large percentage suffered a drop in income.

Figure 2 suggests a method of classifying the families into groups having different types of economic history during the depression for purposes of comparing illness rates. Two broad groups might be made: (1) Families suffering no material change in income from 1929 to 1932, and (2) families whose income changed between 1929 and 1932. Group 1 can be further divided into (*a*) comfortable, 1929–32, (*b*) moderate, 1929–32, and (*c*) poor, 1929–32. Disregarding the relatively few families whose income rose or oscillated, group 2 could be divided into a large number of groups defined by an economic

status rating and the time when the family experienced that status. For example, we might have families with depression history as follows: (1) Comfortable, 1929; poor, 1930, 1931, 1932; (2) comfortable, 1929, 1930; poor, 1931, 1932; and so on. The number of groups feasible

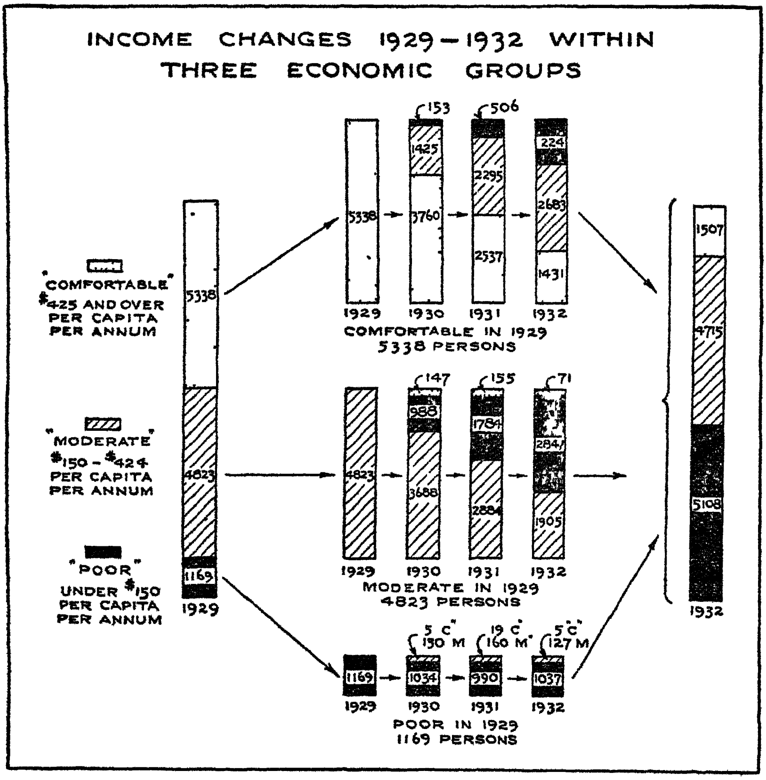


FIGURE 2—Annual shifts (1930–32) in number of individuals in each of three broad income classes of family income per capita in 1929 (11,330 persons in 2,566 families in Birmingham, Detroit, and Pittsburgh)

The chart is designed to show graphically how families changed from one income class to another during the 3 years following 1929

Thus, it is seen that of the 5,338 individuals who were "comfortable" (per capita income of $425 or more) in 1929, 3,760, or 70 percent, had this income in 1930, 2,537, or 48 percent, in 1931, and only 1,431, or 27 percent, were still "comfortable" in 1932 This drop in the number in the 'comfortable' group of 1929 was made up of 2,683, or 50 percent, who had dropped to the "moderate" class ($150–$424) by 1932 and 1,224, or 23 percent, who had dropped to the "poor" group (under $150)

In the same way, the history may be followed of the 4,823 individuals in the "moderate" income group in 1929 By 1932, only 1,905, or 40 percent, of these were still in the "moderate" group, 2 847, or 59 percent had fallen into the "poor" group, and only 71, or 1 percent, had risen to the 'comfortable" group

Of the 1,169 who were "poor" in 1929, 127, or 11 percent, had risen to "moderate" circumstances in 1932, and only 5 persons (one family) to "comfortable" circumstances The other 89 percent remained "poor" in 1932

to use in a sickness study will obviously depend on the size of the population being studied. In the present report, which covers only some 11,000 individuals, a relatively few groups have been used, which describe the depression history in a manner as specific as

possible without giving too small a population to be significant for statistical study. As other cities are added to the tabulations, depression history groups will be made increasingly specific.

ILLNESS AND 1932 INCOME

Inquiry was made about illness from all diseases and accidents, including mild as well as severe cases. What was included as illness was to a considerable extent a matter of what the informant (usually the housewife) remembered and designated as such. Hence the records of disabling cases are probably better measures of real sickness than are the total cases, because the disabling illnesses are more likely to be accurately and completely reported. A case sufficiently severe to be disabling or confine the individual to his bed within the 3 months of the interview is very likely to be remembered, while

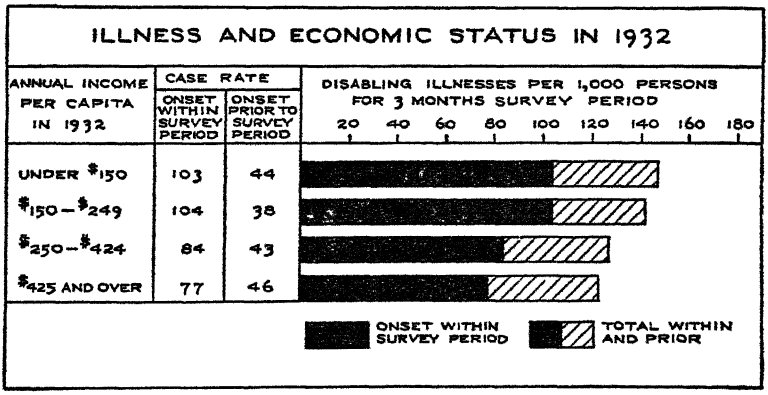


FIGURE 3.—Disabling illness during a 3 months' period in the early spring of 1933 in wage-earning families classified according to income per capita in 1932, in Birmingham, Detroit, and Pittsburgh.

many of the minor ailments are forgotten and are consequently not mentioned to the enumerator.

Illnesses are classified as having (1) onset within the survey period and (2) onset prior to the survey period. Each of these groups is shown as (*a*) all cases, (*b*) disabling cases, consisting of those causing inability to carry on their usual activities, and (*c*) cases in which the patient was confined to bed for 1 or more days. All bed cases are included in the disabling class.

The illness rates are for the 3-month period of the survey and are not reduced to an annual basis. The "survey period" refers to the 3 months prior to the enumerator's visit; it is the period of time for which illness data were recorded.[4]

In table 3 and figure 3 the incidence of illness is shown for four groups of the surveyed population classified according to annual per capita income in 1932 to show the relation between economic status and illness as it was found in 1933. Inspection of the table and graph

[4] See footnote to table 3 for calendar months included, etc.

shows a lower illness rate [5] for the higher income groups, when illnesses with onset within the survey period are considered. Illnesses with onset prior to the survey period (largely chronic cases) show no relation to income. For illnesses within the survey period, the disabling case rate among the two lower income groups (under $250) is 35 percent higher and the bed case rate 47 percent higher than among the group having an annual family income per capita of $425 and over. The poor in 1932 in the surveyed group are obviously subject to more illness than their more fortunate neighbors in relatively comfortable circumstances.

TABLE 3.—*Illness and 1932 income*

Incidence of illness as related to 1932 family income per capita in canvassed white families in Birmingham, Detroit, and Pittsburgh. The group comprised 2,566 families, including 11,330 individuals

Annual family income per capita in 1932	Illness rate per 1,000 persons for 3 months' survey period [1]						Population observed
	Onset within period			Onset prior to period			
	Total	Disabling	Bed	Total	Disabling	Bed	
Under $150	151	103	94	75	44	32	5,108
$150 to $249	143	104	94	66	38	31	2,490
$250 to $424	136	84	74	70	43	33	2,225
$425 and over	127	77	64	85	46	32	1,507

[1] The survey period refers to the 3 months prior to the enumerator's visit. The canvass in each city required from 3 to 4 weeks. The dates of the canvass were slightly different in each city but were between Mar. 20, 1933, and May 15, 1933, for all 3 cities.

It may be argued, however, that a large percentage of the individuals who were poor in 1932 were the chronically poor, the "unemployables" who were perhaps in a state of poverty *because* of sickness and that this group with a very high illness rate raises the average rate of the poor in 1932. To investigate this point, further study of the group was made.

ILLNESS AND INCOME CHANGE

In this analysis the individuals were divided into six categories according to economic status in 1929 and 1932, as follows:

I. Individuals experiencing lowered family income per capita between 1929 and 1932 were classified as—

(1) Comfortable in 1929 and poor in 1932;

(2) Moderate in 1929 and poor in 1932;

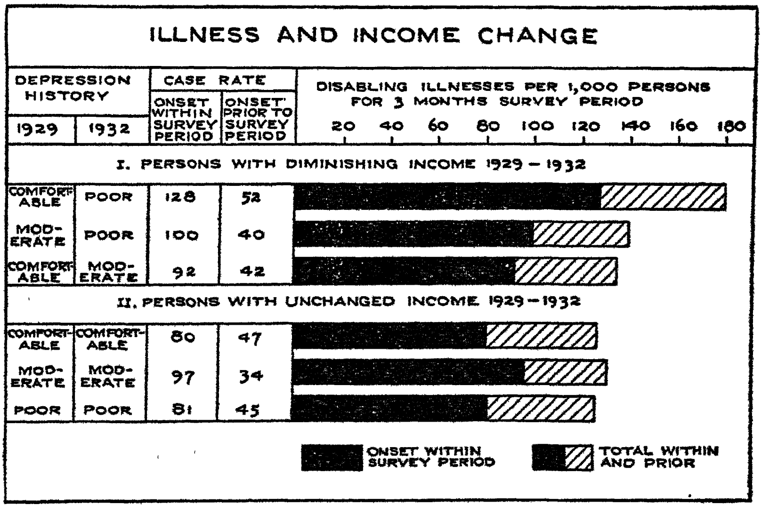
(3) Comfortable in 1929 and moderate in 1932.

[5] Crude rates in vital statistics often give rise to erroneous conclusions. Three possible sources of error in the present study occur to the writers: (1) Variation in age distribution in the different income and "depression history" groups, (2) variation in family size in these groups (illnesses may not be completely reported in large families), and (3) possible concentration of sickly individuals in the lower income groups, who were the first to feel the effects of the depression because of the handicap of a tendency to sickness. Preliminary tabulations have been made to investigate these possible sources of error and so far no adjustments found necessary have changed the trends observed in the crude rates. Later papers including more cities will present data on these factors.

II. Individuals who had not experienced lowered family income between 1929 and 1932 were classified as—

(1) Comfortable in 1929 and 1932;
(2) Moderate in 1929 and 1932;
(3) Poor in 1929 and 1932.

The results are given in table 4 and figure 4. Here we see a significant difference between the illness rate of group I (102 disabling) and group II (87 disabling). The highest illness rate in group I is ex-



Comfortable.... $425 and over per capita per year.
Moderate........ $150–$424 per capita per year.
Poor.............. Under $150 per capita per year.

FIGURE 4.—Disabling illness during a 3 months' period in the early spring of 1933 in wage-earning families classified according to change in per capita income 1929–32, in Birmingham, Detroit, and Pittsburgh.

perienced by individuals whose fortunes had suffered the greatest change, namely, the group "comfortable in 1929 and poor in 1932." This group, with a rate of 128 per 1,000, showed an incidence of disabling illness 60 percent higher than the rate (80) of their more fortunate neighbors who were equal in status in 1929 but suffered no drop in income by 1932, that is, the "comfortable in 1929 and 1932" group. The group which had dropped from comfortable to moderate showed a 15 percent higher disabling illness rate than the comfortable group which had experienced no drop in income. Those families which had dropped from moderate to poor show about the same illness rate as the group which had been in moderate circumstances throughout the 4 years.

TABLE 4.—*Illness and change in income*

Incidence of illness among families classified according to change in the annual per capita income from 1929 to 1932, Detroit, Pittsburgh, Birmingham

Depression history[1]		Case rate per 1,000 persons for 3 months' survey period[2]						Population observed
		Onset within period			Onset prior to period			
1929	1932	Total	Disabling	Bed	Total	Disabling	Bed	
I. FAMILIES WITH DIMINISHED INCOME, 1929–1932								
Comfortable	Poor	189	128	114	88	52	39	1,224
Moderate	Poor	141	100	93	63	40	28	2,847
Comfortable	Moderate	142	92	81	75	42	33	2,683
Total		150	102	92	72	43	32	6,754
II. FAMILIES WITH NO MATERIAL CHANGE IN INCOME, 1929–1932								
Comfortable	Comfortable	130	80	66	87	47	33	1,431
Moderate	Moderate	136	97	88	56	34	27	1,905
Poor	Poor	134	81	75	91	45	35	1,037
Total		133	87	78	75	41	31	4,373

[1] Comfortable=$425 and over per capita per year.
Moderate=$150 to $424 per capita per year.
Poor=under $150 per capita per year.
[2] See footnote to table 3.

The same trends are observed for the total illnesses, onset within the survey period, and even the addition of the cases with onset prior to the survey period (largely chronic) does not obscure the fact that a relatively large drop in economic status appears to be associated with a high illness rate.

UNEMPLOYMENT AND ILLNESS

In table 5 and figure 5 is shown the relation between unemployment and the illness rate. The surveyed group has been divided into 3 classes of individuals, those from families having (1) no employed workers, (2) 1 or more part-time workers but no full-time workers, and (3) 1 or more full-time workers with or without additional part-time workers. As might be expected from the relation between sickness and 1932 income, the illness rate is highest in the families having no employed workers (122 disabling cases per 1,000) and lowest in the households having full-time workers (88 per 1,000). The group with no employed workers has a higher illness rate than the group with annual per capita income under $150 (table 3)—122 as against 103 disabling cases per 1,000 persons.

TABLE 5.—*Illness and unemployment*

Incidence of illness among families classified according to the number of employed workers during 1932, Birmingham, Detroit, Pittsburgh

Employed workers in the family	Case rate per 1,000 persons for 3 months' survey period [1]						Population observed
	Onset within period			Onset prior to period			
	Total	Disabling	Bed	Total	Disabling	Bed	
No employed workers	160	122	114	91	55	40	1,402
Part-time workers (1 or more; no full-time)	157	98	89	70	40	30	4,561
Full-time workers (1 or more; 0 or more part-time)	127	88	77	72	42	32	5,367

[1] See footnote to table 3.

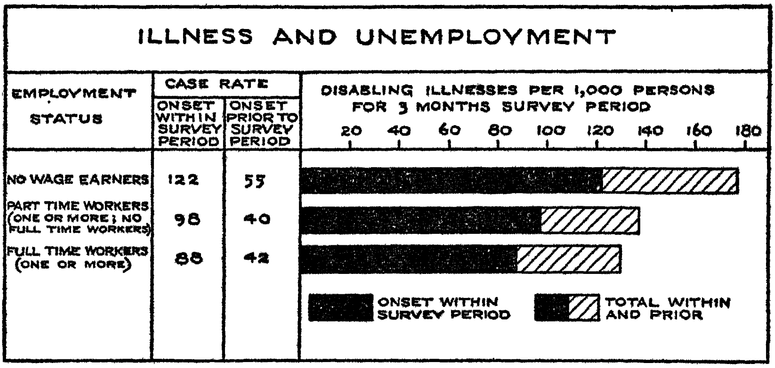


FIGURE 5.—Disabling illness during a 3 months' period in the early spring of 1933 in families classified according to the employment of wage-earning members, in Birmingham, Detroit, and Pittsburgh.

SUMMARY

Records of illness in 1933 and economic history from 1929 to 1932 have been collected from more than 12,000 families in 8 large cities, a group of coal-mining communities, and a group of cotton-mill villages. This paper presents preliminary results of the survey in three cities—Birmingham, Detroit, and Pittsburgh. This group comprised 2,566 families and included 11,330 individuals.

The results show a higher incidence of disabling illness among individuals in the lower-income classes in 1932 than among individuals with higher incomes. The highest illness rate is reported by a group which was in reasonably comfortable circumstances in 1929 but which had dropped to comparative poverty by 1932; their rate is 60 percent higher than that of their more fortunate neighbors who were equal in economic status in 1929 but suffered no drop in income by 1932. The group of individuals who may be described as the "chronically poor", that is, individuals who were in a condition of poverty even in 1929, showed a relatively low sickness rate as compared with the group which

had fallen into straitened circumstances as a result of the economic depression. The rate of disabling illness reported among individuals from families of the unemployed was 39 percent higher than that of the group having full-time wage earners and 25 percent higher than that of the group containing part-time but no full-time workers.

The foregoing findings are generally true for the surveyed group in each of the cities as well as for the total of the three cities.

As regards the significance of the findings, the writers have purposely refrained from drawing conclusions as to their broad implications and the reader is cautioned to exercise similar restraint. For example, how large a proportion of the entire wage-earning population in urban areas in the United States has suffered increased illness obviously cannot be estimated from the experience recorded in the samples surveyed in three cities only. Nor is it possible to suggest any specific interpretations of increased illness rates in terms of impaired vitality until the nature of the sickness experienced is considered. Conclusions and interpretations of this kind should await more complete analysis of the entire volume of data collected.

COURT DECISION RELATING TO PUBLIC HEALTH

Narcotic drug law construed.—(California District Court of Appeal, 2d Dist.; *People* v. *Randolph*, 23 P. (2d) 777; decided July 6, 1933.) The defendant was charged with and convicted of violating the statute relating to narcotic drugs by having in his possession a preparation of morphine containing more than one-fourth grain of morphine to the avoirdupois ounce. The act made it unlawful for any person to have in his possession any opium except on the written order or prescription of a physician, dentist, or veterinary surgeon licensed to practice in the State (Deering's Gen. Laws, 1931, act 5323). In upholding the conviction, the court of appeal said:

The evidence shows that four bindles of morphine were found sewed in the lining of appellant's coat. Appellant denies having any knowledge of its presence in his coat and claimed to have purchased the coat secondhand in some place on Main Street sometime before. * * * Such defense merely created a conflict with the prima facie case made out by the people showing that such morphine was in plaintiff's possession. Neither intent nor knowledge is an element of this offense. The mere possession is a violation of the act. *People* v. *Le Baron*, 92 Cal. App. 550, 268 P. 651, 269 P. 476. The only perfect defense is a valid prescription under the act. Any other defense is for the consideration of the judge or jury, as the case may be; and the defense made having been rejected by the trial court, nothing remains to be considered on appeal in view of the fact of possession which the court must have found.

DEATHS DURING WEEK ENDED SEPTEMBER 23, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Sept. 23, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	6,992	6,741
Deaths per 1,000 population, annual basis	9.8	9.6
Deaths under 1 year of age	563	566
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	50	47
Deaths per 1,000 population, annual basis, first 38 weeks of year	10.9	11.2
Data from industrial insurance companies:		
Policies in force	67,704,198	70,529,728
Number of death claims	10,972	10,919
Death claims per 1,000 policies in force, annual rate	8.5	8.1
Death claims per 1,000 policies, first 38 weeks of year, annual rate	9.9	9.7

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended September 30, 1933, and October 1, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 30, 1933, and Oct. 1, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Sept. 30, 1933	Week ended Oct. 1, 1932	Week ended Sept. 30, 1933	Week ended Oct. 1, 1932	Week ended Sept. 30, 1933	Week ended Oct. 1, 1932	Week ended Sept. 30, 1933	Week ended Oct. 1, 1932
New England States:								
Maine	1	3	5	2	3	1	0	0
New Hampshire		1					0	0
Vermont		1			2	1	0	0
Massachusetts	21	18		2	15	53	0	3
Rhode Island	2	5			2	1	0	0
Connecticut	4	5	1		1	2	0	0
Middle Atlantic States:								
New York	41	41	[1] 7	[1] 13	41	90	4	4
New Jersey	22	9	10	4	15	41	0	1
Pennsylvania	52	94			23	64	3	7
East North Central States:								
Ohio [2]	57	75	60	4	15	37	1	1
Indiana	29	75	33	8	2	3	3	8
Illinois [2]	32	83	15	7	15	14	2	3
Michigan	19	22	2	1	34	41	1	3
Wisconsin	4	14	20	16	33	49	3	1
West North Central States:								
Minnesota	4	11		3	5	22	0	2
Iowa [3]	7	6			3	1	0	1
Missouri [3]	51	67	1		4		2	3
North Dakota	3	2			15	10	0	0
South Dakota	2	1			1	2	0	0
Nebraska	5	21				5	0	0
Kansas	5	17	3	1	3	2	3	0
South Atlantic States:								
Delaware	1	2					0	0
Maryland [3]	29	10	10	3	1	2	1	0
District of Columbia	6	3			1	2	0	0
Virginia	98	64			8	18	0	0
West Virginia	62	67	7	6	1	19	1	0
North Carolina [3]	117	75	46	24	23	24	0	1
South Carolina [3]	31	17	142	190	22	7	0	0
Georgia [3]	53	48		32	10	11	2	1
Florida [3]	15	11		1			0	0
East South Central States:								
Kentucky	116	74				47	1	0
Tennessee	77	65	11	15	14		1	2
Alabama [3]	97	94	23	10	5	2	2	1
Mississippi [3]	36	35					0	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 30, 1933, and Oct. 1, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Sept. 30, 1933	Week ended Oct. 1, 1932	Week ended Sept. 30, 1933	Week ended Oct. 1, 1932	Week ended Sept. 30, 1933	Week ended Oct. 1, 1932	Week ended Sept. 30, 1933	Week ended Oct. 1, 1932
West South Central States:								
Arkansas	25	37	1	18	17	2	0	0
Louisiana	28	24	6	10		5	2	1
Oklahoma [4]	52	65	12	13	2		0	0
Texas [2]	108	120	83	43	31	3	2	0
Mountain States:								
Montana	2	1	11	16	1	45	0	0
Idaho		5	1				0	0
Wyoming		1	3		2	1	0	1
Colorado	1	7			4	5	0	2
New Mexico	10	8			4	2	0	0
Arizona	2	2	2		4	2	0	0
Utah [3]	1		1		7	1	0	1
Pacific States:								
Washington	3	8		3	30	6	1	0
Oregon	3	2	19	35	9	14	1	0
California	31	47	35	146	71	25	1	3
Total	1,365	1,466	570	626	499	682	37	52

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Sept. 30, 1933	Week ended Oct. 1, 1932	Week ended Sept. 30, 1933	Week ended Oct. 1, 1932	Week ended Sept. 30, 1933	Week ended Oct. 1, 1932	Week ended Sept. 30, 1933	Week ended Oct. 1, 1932
New England States:								
Maine	0	1	4	11	0	0	11	7
New Hampshire	2	0	11	4	0	0	0	0
Vermont	3	0	5	3	0	0	0	0
Massachusetts	13	2	86	133	0	0	6	8
Rhode Island	2	0	15	14	0	0	0	1
Connecticut	7	1	26	18	0	0	1	8
Middle Atlantic States:								
New York	77	16	148	161	0	0	31	26
New Jersey	13	22	52	56	0	0	8	11
Pennsylvania	30	110	168	238	0	0	70	71
East North Central States:								
Ohio [2]	43	3	305	227	0	4	56	90
Indiana	1	1	103	88	1	0	20	21
Illinois [2]	15	8	133	167	0	0	27	37
Michigan	8	8	128	113	0	0	10	22
Wisconsin	7	2	28	28	1	1	1	8
West North Central States:								
Minnesota	23	9	16	29	0	0	2	4
Iowa [3]	2	2	42	33	0	7	14	41
Missouri [3]	1	0	51	59	7	0	12	18
North Dakota	5	2	12	9	0	0	2	13
South Dakota	3	0	7	6	1	0	2	1
Nebraska	1	0	8	16	0	0	0	0
Kansas	1	2	54	61	0	0	10	11
South Atlantic States:								
Delaware	0	0	11	3	0	0	3	2
Maryland [3]	3	0	52	34	0	0	23	20
District of Columbia	1	2	15	8	0	0	7	1
Virginia	2	2	102	58	0	0	20	29
West Virginia	4	4	73	57	1	3	47	53
North Carolina [3]	3	0	113	70	0	0	16	7
South Carolina [3]	2	0	10	8	0	0	31	12
Georgia [3]	0	0	20	29	0	0	17	37
Florida [3]	1	0		2	0	0	1	1
East South Central States:								
Kentucky	3	1	138	71	0	0	47	51
Tennessee	4	0	71	66	0	3	43	36
Alabama [3]	2	1	52	57	1	0	27	24
Mississippi [3]	0	1	18	7	0	0	8	12

See footnote at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 30, 1933, and Oct. 1, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Sept. 30, 1933	Week ended Oct. 1, 1932	Week ended Sept. 30, 1933	Week ended Oct. 1, 1932	Week ended Sept. 30, 1933	Week ended Oct. 1, 1932	Week ended Sept. 30, 1933	Week ended Oct. 1, 1932
West South Central States:								
Arkansas	0	0	13	11	0	0	9	12
Louisiana	1	2	9	6	0	0	19	17
Oklahoma [4]	4	1	12	19	1	0	55	40
Texas [2]	3	3	40	51	5	6	74	29
Mountain States:								
Montana	0	1	9	9	0	3	6	5
Idaho	0	0	5	2	2	0	0	2
Wyoming	1	1	0	6	0	2	0	3
Colorado	0	0	13	54	0	2	11	8
New Mexico	1	0	15	8	1	0	23	19
Arizona	1	0	13	14	0	0	8	7
Utah [3]	2	0	5	2	0	0	2	1
Pacific States:								
Washington	14	3	13	17	6	5	3	6
Oregon	2	1	22	8	0	0	7	1
California	5	5	118	81	12	11	9	17
Total	316	217	2,364	2,232	39	47	799	850

[1] New York City only.
[2] Typhus fever, week ended Sept. 30, 1933, 78 cases, as follows: Ohio, 1; Illinois, 1; North Carolina, 2; South Carolina, 2; Georgia, 19; Florida, 6; Alabama, 37; Texas, 10.
[3] Week ended earlier than Saturday.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
August 1933										
Alabama	1	113	33	589	36	37	1	64	1	128
Georgia	3	139	61	604	132	32	5	47	1	153
Illinois	19	57	34	45	68	2	54	377	3	150
Louisiana	4	59	24	553	17	30	6	44	6	185
Maine	1	1	1		8		9	16	0	13
Oregon		2	27	7	74		5	35	16	16
Texas	6	208	200	1,525		54	9	95		312
Virginia	3	92	96	33	89	11	6	97	0	147

August 1933

	Cases
Anthrax:	
Louisiana	1
Chicken pox:	
Alabama	2
Georgia	1
Illinois	105
Maine	30
Oregon	29
Virginia	29
Conjunctivitis:	
Georgia	8
Dengue:	
Alabama	2
Georgia	1
Diarrhea and dysentery:	
Virginia	481
Dysentery:	
Georgia	20
Illinois (amebic)	13
Illinois (bacillary)	24
Louisiana	9
German measles:	
Illinois	13
Maine	6
Hookworm disease:	
Georgia	90
Illinois	12
Louisiana	19
Impetigo contagiosa:	
Illinois	3
Oregon	16
Lead poisoning:	
Illinois	2
Lethargic encephalitis:	
Alabama	2
Illinois	24
Maine	2
Virginia	2
Mumps:	
Alabama	10
Georgia	11
Illinois	122
Mumps—Continued.	
Louisiana	5
Maine	10
Oregon	14
Virginia	8
Ophthalmia neonatorum:	
Alabama	1
Illinois	3
Paratyphoid fever:	
Georgia	8
Maine	1
Oregon	3
Texas	26
Virginia	5
Rabies in animals:	
Illinois	20
Louisiana	10
Maine	6
Rabies in man:	
Alabama	1
Illinois	1

	Cases
Rocky Mountain spotted fever:	
Alabama	1
Georgia	1
Virginia	3
Scabies:	
Oregon	6
Septic sore throat:	
Georgia	19
Illinois	11
Louisiana	1
Oregon	2
Virginia	5
Tetanus:	
Alabama	6
Illinois	8
Tetanus—Continued.	
Louisiana	6
Maine	2
Virginia	1
Trachoma:	
Georgia	3
Illinois	5
Tularaemia:	
Georgia	3
Illinois	2
Louisiana	3
Virginia	4
Typhus fever:	
Alabama	87
Georgia	83
Illinois	1
Virginia	4
Undulant fever:	
Alabama	1
Georgia	5
Illinois	7
Louisiana	1
Maine	1
Virginia	4
Vincent's angina:	
Illinois	30
Oregon	4
Whooping cough:	
Alabama	80
Georgia	54
Illinois	663
Louisiana	25
Maine	75
Oregon	26
Virginia	127

LETHARGIC ENCEPHALITIS, ST. LOUIS, MO.

From July 1 to October 1, 1933, 504 cases of lethargic encephalitis were reported in the city of St. Louis with 105 deaths. In the county of St. Louis during this period there were 509 cases with 81 deaths. In St. Clair and Madison Counties, Illinois, across the Mississippi River, 15 cases of lethargic encephalitis and 1 death were reported.

WEEKLY REPORTS FROM CITIES

City reports for week ended Sept. 23, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	0	2	1	0	0	0	6	17
New Hampshire:											
Concord	0	------	0	0	0	0	0	0	0	0	8
Nashua	0	------	0	0	0	1	0	0	0	0	0
Vermont:											
Barre	0	------	0	0	0	0	0	0	0	0	2
Burlington	0	------	0	0	0	0	0	0	0	0	10
Massachusetts:											
Boston	3	------	0	4	13	27	0	9	1	20	180
Fall River	0	------	0	0	1	1	0	1	0	17	19
Springfield	0	------	0	0	0	0	0	1	0	3	22
Worcester	0	------	0	8	3	9	0	4	0	12	44
Rhode Island:											
Pawtucket	1	------	0	0	0	2	0	0	0	0	10
Providence	1	------	0	1	8	6	0	4	0	25	64
Connecticut:											
Bridgeport	0	------	0	0	0	2	0	3	0	0	31
New Haven	0	1	0	0	2	0	0	0	0	4	30
New York:											
Buffalo	5	------	1	3	7	7	0	6	0	19	128
New York	15	6	3	10	71	29	0	72	20	131	1,191
Syracuse	0	------	0	1	0	4	0	1	0	16	49
New Jersey:											
Camden	4	------	0	1	1	7	0	1	1	0	31
Newark	0	3	0	3	5	4	0	4	0	24	106
Trenton	0	------	0	1	1	0	0	2	0	1	20
Pennsylvania:											
Philadelphia	0	2	2	7	11	24	0	27	3	16	372
Pittsburgh	11	1	1	0	6	12	0	3	3	38	120
Reading	0	------	0	0	2	1	0	0	0	6	22
Ohio:											
Cincinnati	3	------	0	6	4	5	0	1	3	26	126
Cleveland	0	27	0	1	5	35	0	6	1	28	153
Columbus	0	------	0	0	3	12	0	3	0	2	67
Toledo	0	------	0	0	0	9	0	4	0	3	66
Indiana:											
Fort Wayne	0	------	0	0	4	3	0	0	1	0	28
Indianapolis	2	------	0	0	5	6	0	3	1	4	------
South Bend	0	------	0	0	1	3	0	1	1	0	13
Terre Haute	1	------	0	0	0	0	0	0	1	0	12

City reports for week ended Sept. 23, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Illinois:											
Chicago	2	2	0	2	24	46	0	32	2	56	612
Springfield	0	------	0	0	2	1	0	0	1	0	25
Michigan:											
Detroit	14	2	0	4	7	36	0	9	5	90	193
Flint	0	------	0	0	0	1	0	1	2	0	24
Grand Rapids	0	------	0	1	0	1	0	2	0	11	26
Wisconsin:											
Kenosha	0	------	0	1	0	0	0	0	0	0	3
Madison	0	------	0	1	0	0	0	0	0	3	5
Milwaukee	0	------	0	1	2	6	0	2	0	64	86
Racine	0	------	0	0	1	0	0	1	0	14	8
Superior	0	------	0	0	0	0	0	0	0	3	12
Minnesota:											
Duluth	0	------	0	1	0	8	0	0	1	6	16
Minneapolis	2	------	0	0	3	3	0	1	0	8	79
St. Paul	1	------	0	1	2	1	0	3	0	4	53
Iowa:											
Des Moines	3	------	0	0	0	9	0	0	0	0	26
Sioux City	0	------	0	0	0	2	0	0	0	0	1
Waterloo	0	------	--------	1	-------	0	0	0	0	0	--------
Missouri:											
Kansas City	1	------	0	0	4	1	0	8	1	6	100
St. Joseph	1	------	0	0	2	0	0	0	1	0	39
St. Louis	16	------	0	4	2	2	0	6	5	15	195
North Dakota:											
Fargo	0	------	0	0	0	0	0	0	0	1	5
Grand Forks	0	------	0	0	0	0	0	0	0	0	--------
South Dakota:											
Aberdeen	0	------	0	0	0	0	0	0	0	0	--------
Nebraska:											
Omaha	0	------	0	1	4	4	0	0	0	4	51
Kansas:											
Topeka	0	------	0	0	2	1	0	0	0	6	14
Wichita	1	------	0	0	2	2	0	1	1	3	14
Delaware:											
Wilmington	0	------	0	0	0	3	0	0	0	5	23
Maryland:											
Baltimore	0	4	1	0	15	11	0	16	2	31	184
Cumberland	4	------	0	1	0	2	0	0	0	0	9
Frederick	0	------	0	0	1	1	0	0	0	0	5
District of Columbia:											
Washington	4	------	0	2	3	9	0	11	5	7	126
Virginia:											
Lynchburg	3	------	0	0	0	0	0	0	1	2	4
Richmond	5	------	0	1	4	4	0	1	1	1	43
Roanoke	0	------	0	0	2	1	0	1	0	3	18
West Virginia:											
Charleston	1	------	0	0	1	0	0	4	-------	1	17
Huntington	5	------	0	0	0	1	0	0	0	0	--------
Wheeling	0	------	0	0	0	3	0	0	1	6	9
North Carolina:											
Wilmington	3	------	0	0	0	0	0	0	0	0	12
Winston-Salem	10	------	0	0	0	1	0	1	0	2	8
South Carolina:											
Charleston	1	6	0	0	1	0	0	2	2	0	21
Columbia	------	------	--------	------	-------	------	------	-------	------	-------	--------
Greenville	0	------	0	0	0	3	0	0	0	2	4
Georgia:											
Atlanta	6	------	0	0	5	3	0	1	3	3	82
Brunswick	0	------	0	0	0	0	0	0	0	0	7
Savannah	0	10	0	7	4	1	0	0	0	0	31
Florida:											
Tampa	1	------	0	0	0	0	0	1	0	0	17
Kentucky:											
Ashland	1	------	0	0	0	2	0	0	0	7	--------
Lexington	0	------	0	0	1	2	0	0	0	0	15
Louisville	2	------	0	1	4	5	0	0	2	6	60
Tennessee:											
Memphis	5	------	0	1	5	5	0	6	0	3	98
Nashville	2	------	0	0	0	5	0	2	0	7	44

City reports for week ended Sept. 23, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Alabama:											
Birmingham	9	------	0	5	2	0	0	1	2	1	52
Mobile	3	------	1	0	1	0	0	4	4	0	28
Montgomery	2	------	0	0	0	2	0	0	0	2	------
Arkansas:											
Fort Smith	1	------	------	0	------	1	0	------	0	0	------
Little Rock	[1] 1	------	0	4	4	1	0	2	0	0	6
Louisiana:											
New Orleans	6	1	0	0	10	9	0	7	1	0	147
Shreveport	0	------	0	0	3	1	0	1	1	1	26
Oklahoma:											
Tulsa	1	------	------	0	------	2	0	------	0	1	------
Texas:											
Dallas	11	------	0	0	3	6	0	4	2	------	53
Fort Worth	2	------	0	0	2	2	0	1	2	0	28
Galveston	0	------	0	0	0	0	0	0	0	0	6
Houston	7	------	0	0	0	2	0	2	0	0	64
San Antonio	1	------	0	0	2	3	0	7	1	1	55
Montana:											
Billings	4	------	0	0	0	0	0	0	0	0	6
Great Falls	0	------	0	0	1	0	0	0	0	0	12
Helena	0	------	0	1	0	0	0	0	0	0	3
Missoula	0	------	0	0	0	2	0	0	2	0	6
Idaho:											
Boise	0	------	0	0	0	4	0	0	0	0	6
Colorado:											
Denver	4	------	0	2	5	5	0	5	4	10	78
Pueblo	0	------	0	0	0	3	0	0	2	3	8
New Mexico:											
Albuquerque	0	------	0	0	0	0	0	3	5	2	14
Utah:											
Salt Lake City	1	------	0	1	1	6	0	0	0	4	21
Nevada:											
Reno	0	------	0	0	0	0	0	0	0	0	2
Washington:											
Seattle	0	------	0	0	2	3	0	4	0	18	82
Spokane	0	1	1	6	2	0	0	0	0	0	25
Tacoma	0	------	0	0	0	3	0	0	0	4	18
Oregon:											
Portland	2	------	0	1	4	8	1	2	0	2	63
Salem	0	------	0	0	0	1	0	0	0	0	------
California:											
Los Angeles	16	17	0	3	6	32	2	22	0	26	268
Sacramento	2	------	0	0	1	1	1	2	1	2	14
San Francisco	2	4	0	0	7	1	0	12	0	11	156

[1] Nonresident.

City reports for week ended Sept. 23, 1933—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Maine:				Missouri:			
Portland	0	0	4	St. Louis	0	0	2
Massachusetts:				North Dakota:			
Boston	0	0	5	Fargo	0	0	2
Springfield	0	0	1	Maryland:			
Rhode Island:				Baltimore	0	0	1
Providence	0	0	1	Cumberland	0	0	1
New York:				District of Columbia:			
New York	0	2	43	Washington	1	1	1
Syracuse	0	0	3	Georgia:			
New Jersey:				Atlanta	1	0	0
Newark	0	0	5	Tennessee:			
Pennsylvania:				Nashville	0	0	1
Pittsburgh	0	0	5	Texas.			
Ohio:				Dallas	0	1	1
Cincinnati	0	0	2	Montana:			
Cleveland	0	0	13	Great Falls	0	0	1
Columbus	1	1	0	Colorado:			
Indiana:				Denver	1	1	0
Indianapolis	1	1	0	Utah:			
Illinois:				Salt Lake City	0	0	1
Chicago	1	1	8	Washington:			
Michigan:				Seattle	0	1	4
Detroit	0	0	2	Oregon:			
Wisconsin:				Portland	0	0	1
Milwaukee	0	0	1	California:			
Superior	0	0	1	Los Angeles	0	1	2
Minnesota:							
Duluth	0	0	3				
Minneapolis	0	0	17				
St. Paul	0	0	2				

Lethargic encephalitis.—Cases: New York City, 8; Pittsburgh, Pa., 1; Cleveland, 6; Columbus, Ohio, 1; Chicago, 1; Springfield, Ill., 1; Detroit, 1; Grand Rapids, Mich., 4; St. Paul, 1; Sioux City, Iowa, 1; Kansas City, Mo., 8; St. Joseph, 2; St. Louis, 81; Omaha, 8; Winston-Salem, N.C., 1; Louisville, 6; Memphis, 2; Albuquerque, N.Mex., 1; Salt Lake City, 1; Seattle, 1.

Pellagra.—Cases: Baltimore, 1; Charleston, S.C., 1; Memphis, 2; Montgomery, Ala., 1; Brunswick, Ga., 1.

Typhus fever.—Cases: Charleston, S.C., 1; Mobile, 1; Montgomery, Ala., 2.

Rabies in man.—Deaths: Boston, 1.

FOREIGN AND INSULAR

CANADA

Quebec Province—Communicable diseases—2 weeks ended September 23, 1933.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended September 23, 1933, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Ophthalmia neonatorum	1
Chicken pox	28	Poliomyelitis	13
Diphtheria	32	Scarlet fever	75
Erysipelas	7	Tuberculosis	153
German measles	3	Typhoid fever	92
Measles	44	Whooping cough	126

CZECHOSLOVAKIA

Communicable diseases—July 1933.—During the month of July 1933 certain communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	11	1	Paratyphoid fever	16	--------
Cerebrospinal meningitis	4	3	Poliomyelitis	12	3
Chicken pox	146	--------	Puerperal fever	29	17
Diphtheria	1,512	112	Scarlet fever	1,646	18
Dysentery	6	3	Trachoma	112	--------
Influenza	28	2	Typhoid fever	355	29
Lethargic encephalitis	4	3	Typhus fever	6	--------
Malaria	229	--------			

Vital statistics—1932.—The following figures have been published for births, deaths, and marriages in Czechoslovakia during the year 1932:

Population (estimated, midyear)	14,907,068	Death rate per 1,000 population	14.1
Number of births	312,351	Infant mortality rate per 1,000 live births	137.7
Birth rate per 1,000 population	21.0	Number of marriages	127,593
Number of stillbirths	7,032		
Number of deaths	210,254		

Cases of certain diseases, with deaths, were reported in Czechoslovakia during the year 1932 as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	112	40	Scarlet fever	22,294	474
Diphtheria	31,882	2,548	Trachoma	1,668	--------
Diseases of heart and arteries	--------	24,140	Tuberculosis, pulmonary	--------	19,605
Influenza	--------	1,215	Tuberculosis, other forms	--------	22,275
Measles	--------	699	Typhoid and paratyphoid fever	7,722	1,055
Poliomyelitis	385	25	Typhus fever	23	2
Puerperal causes	--------	1,337	Whooping cough	--------	1,085

GREAT BRITAIN

England and Wales—Vital statistics—April–June 1933.—During the second quarter of the year 1933, 154,165 live births and 108,609 deaths were registered in England and Wales. The following statistics are taken from the Quarterly Return of Births, Deaths, and Marriages, issued by the Registrar-General of England and Wales. The figures are provisional.

Birth and death rates in England and Wales, April to June 1933

Annual rates per 1,000 population:	
Live births	15.40
Stillbirths	.66
Deaths, all causes	10.80
Deaths from—	
Diphtheria	.05
Influenza	.11
Measles	.07
Scarlet fever	.01
Annual rates per 1000 population—Continued.	
Deaths from—Continued.	
Typhoid fever and paratyphoid fever	.00
Violence	.53
Whooping cough	.04
Deaths per 1,000 live births:	
Diarrhea and enteritis (under 2 years)	4.90
Total deaths under 1 year	53.00

England and Wales—Infectious diseases—Thirteen weeks ended July 1, 1933.—During the 13 weeks ended July 1, 1933, cases of certain infectious diseases were reported in England and Wales, as follows:

Disease	Cases	Disease	Cases
Diphtheria	9,473	Puerperal pyrexia	1,392
Ophthalmia neonatorum	1,021	Scarlet fever	25,228
Pneumonia	11,461	Smallpox	267
Puerperal fever	504	Typhoid fever	374

IRISH FREE STATE

Vital statistics—First and second quarters 1933.—The following statistics for the Irish Free State for the first and second quarters of the year 1933 are taken from the Quarterly Return of Marriages, Births, and Deaths for the second quarter 1933, issued by the registrar-general.

	First quarter 1933		Second quarter 1933	
	Number	Per 1,000 population	Number	Per 1,000 population
Marriages	3,611	4.8	3,449	4.6
Births	13,739	18.4	14,994	20.0
Total deaths	12,922	17.3	9,731	13.0
Deaths under 1 year	1,067	(1)	892	(1)
Deaths from:				
Cancer	799	1.07	731	.98
Diarrhea and enteritis (under 2 years)	105		83	
Diphtheria	125		70	
Influenza	1,107	1.48	383	.51
Measles	67		36	
Puerperal sepsis	17	[2] 1.24	14	[2] .93
Scarlet fever	29		6	
Tuberculosis (all forms)	920	1.23	940	1.26
Typhoid fever	12		16	
Typhus fever			1	
Whooping cough	80		75	

[1] Deaths under 1 year per 1,000 births: First quarter 1933, 78; second quarter 1933, 59.
[2] Per 1,000 births.

PUERTO RICO

Notifiable diseases—Four weeks ended September 23, 1933.—During the 4 weeks ended September 23, 1933, cases of certain notifiable diseases were reported in the municipalities of Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chicken pox	6	Paratyphoid fever	2
Diphtheria	48	Pellagra	1
Dysentery	208	Pink eye	1
Erysipelas	3	Ringworm	9
Filariasis	15	Syphilis	2
Framboesia	1	Tetanus	3
Influenza	20	Tetanus (infantile)	5
Malaria	3,234	Trachoma	3
Measles	33	Tuberculosis	468
Mumps	27	Typhoid fever	37
Ophthalmia neonatorum	7	Whooping cough	102

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Sept. 29, 1933, pp. 1206–1217. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Oct. 27, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Philippine Islands.—During the week ended September 30, 1933, cholera was reported in the Philippine Islands as follows: Bohol Province, Nasingin Island, 6 cases, 3 deaths; Cebu Province, Barili, 1 case, 1 death; Cebu city, 5 cases, 3 deaths; Minglanilla, 3 cases, 1 death; and Talisan 3 cases, 2 deaths.

Plague

China—Manchuria.—A report dated September 28, 1933, stated that in the villages near Nungan, Hunghsing Station, and Paiyintala, Manchuria, China, 300 deaths from bubonic plague had occurred since August 1933.

Information dated October 6, 1933, stated that a serious epidemic of bubonic and pneumonic plague had been reported on September 26, along the Ssupingkai–Taonan and Chinese Eastern Railways, affecting particularly the cities of Tungliao (Paiyintala), Kaitung, Taonan, Yaomen, and Nungan.

Typhus Fever

Chile—Valparaiso.—During the week ended September 9, 1933, 8 cases of typhus fever with 1 death were reported in Valparaiso, Chile.

Yellow Fever

French West Africa—Niger Territory.—During the week ended September 30, 1933, yellow fever was reported in Niger Territory, French West Africa, as follows: Kaolack, 1 case, and Zinder, 1 case.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

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The Enumeration of Bacteria by Solid and Liquid Media
Deaths in Large Cities During Week Ended September 30
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 48 OCTOBER 20, 1933 NO. 42

GROWTH AND THE ECONOMIC DEPRESSION *

A Study of the Weight of Elementary School Children in 1921–27 and in 1933

By CARROLL E. PALMER, M.D., *Consultant in Child Hygiene, United States Public Health Service* **

In a recent paper (1) on the growth of school children in Hagerstown, Md., it was shown that the average weight of children of given age and sex did not vary a statistically significant amount from year to year during the period from 1921 through 1927. The study reported here was undertaken for the purpose of determining, insofar as possible on the data available, whether or not the weights of children now living in Hagerstown differ significantly from the weights of children of the same age and sex in that city during the more prosperous years of the previous decade. Reasons for projecting such a study scarcely need be given. It may be recalled that studies (for example, (2) and (3)) on the weight and health of children in certain sections of central Europe during the recent war and post-war period showed clearly the detrimental effects of adverse economic conditions. Obviously, conditions in the United States at the present time are far better than those which obtained in certain of the warring nations during and immediately following the war; but it is believed, at least in some localities, that the effects of undernutrition are becoming noticeable. While it is evident that Hagerstown does not represent the most severely stricken type of community, the city typifies the small urban community which has passed, or is now passing, through a distinct though moderate economic disturbance. Inasmuch as approximately 20 million persons, or nearly 15 percent of the population of the entire country, live in similar communities which are passing through similar disturbances, the determination of possible relationships between the growth of the children and their economic status is of timely interest.

* From the Office of Field Investigations in Child Hygiene, U.S. Public Health Service, in cooperation with the Department of Biostatistics (Paper no. 186) of the School of Hygiene and Public Health, the Johns Hopkins University, Baltimore, Md.

** The writer has to thank Supt. B. J. Grimes, Isabel Beckenbaugh, Cecile Gutelius, Eva Huyett, Kleora Sands, Mrs. M. E. Smith, J. B. H. Bowser, H. L. Rinehart, and the many grade school teachers of the Hagerstown Public Schools, and, as well, Alice Edmonds, Ann Diehl, Katherine Schindel, Hilda Ashman, and Eugenie Osgood, all of whom gave generously of their time and energy to make possible the collection of the data.

The social, demographic, and previous economic characteristics of the city of Hagerstown have been reviewed by Sydenstricker (4). It will be sufficient here, therefore, to summarize briefly certain points and to consider changes which have occurred during the past few years.

In population, Hagerstown has increased slowly during the last decade and now includes approximately 32,000 persons. Nearly 90 percent are native white of native parents, about 2 percent are foreign born, and slightly more than 5 percent are Negroes. There is, and has been recently, no considerable amount of migration either to or from the city. In general, the population may be considered to be relatively stable.

Employment in Hagerstown, for the most part, is furnished by the wholesale and retail trades, transportation, and small factories. The largest proportion of the wage-earning group is employed in railroad shops, in a large sand-blast plant, and in shoe, textile, furniture, and clothing factories. During the past 2 years, and especially during the last year, work in these places has been greatly curtailed. In the autumn of 1932 two of the city's five banks closed. After the Nation-wide closing of banks on March 6, 1933, until the present time (July), only 1 bank has opened on a 100 percent withdrawal basis.

The charitable agencies of the city are consolidated in a central organization known as The King's Daughters. Since 1929 welfare work has gradually increased. During 1931 and for a part of 1932, from 250 to 350 families were receiving aid, and since the fall of 1932 this number has increased until, in the spring of 1933, more than 600 families were being supported entirely or in part from welfare funds. Through the efforts of the King's Daughters and with the aid of a few public spirited individuals, it was found possible to give free noonday lunches during the past academic year to all really needy children attending the elementary schools. Eligibility for the lunches is determined on the basis of the economic status of the family. It may be stated, and the fact must be appreciated in interpreting the results of this study, that the charitable work done by this organization is highly competent and efficient. As a result of its work, few families, and certainly few families with children, are being denied the elementary necessities.

MATERIAL AND METHODS

The material on which this study is based, aside from data already published, was collected at Hagerstown between May 16 and May 25, 1933. At that time the attempt was made to weigh and interrogate all of the white children attending the first six grades in the

public schools. Only a few children who were absent when their classmates were weighed, or for some other reason were temporarily unavailable, were missed. Of the records obtained, all of those for children from 6 through 11 years of age, a total of 1,269 girls and 1,245 boys, are used in this paper.

Weighings were made on beam scales, 1 of which was available in each of the 7 school buildings. Each scale was carefully calibrated at the beginning of the investigation. Weights were recorded to the nearest quarter pound and include the regular indoor clothing except shoes, coats, sweaters, and vests. With the exception of approximately 650 children (those attending the Broadway Street School), the actual weighings were made by the writer. At the time of measurement each child was asked whether or not his father (or mother) was regularly employed, and a record was made of the approximate number of days of employment per week. In addition to this information, lists were obtained showing the names of children who received free lunch at school or whose parents were receiving aid from the city charities.

The data with which these observations are to be compared were collected at Hagerstown during the period 1921 through 1927. At that time the United States Public Health Service, assisted by the Washington County Health Department, the School of Hygiene and Public Health of the Johns Hopkins University, and other organizations, carried out extensive studies on the growth and health of school children. Among other things, a large group of children was weighed each year and from the data collected it was possible to prepare sex and age specific frequency distributions of the weights of children for each separate year from 1921 through 1927. The results of the analysis of these distributions are reported in another paper (1), wherein it is shown that the averages for the separate years did not exhibit significant fluctuations about averages based on the entire 7 years' experience. In the present study, therefore, the 1933 observations will be compared with the averages for the entire 7 years, rather than with averages for any one of the individual years between 1921 and 1927.

No detailed discussion is given in this paper concerning the methods used in the statistical reduction of the data. Information relative to the method of analysis of the earlier data will be found in two previous papers (1, 5), and precisely the same methods are employed in the reduction of the 1933 material. It may be mentioned, however, that age is classified, for both the 1921–27 and the 1933 data, as of the birthday nearest January 1 of the school year for which the measurement was made.

COMPARISON OF AVERAGE WEIGHT IN 1921–27 AND IN 1933

The basic data necessary for the comparison are given in tables 1 and 2, and in the graphic presentation of figure 1. The tables and graph show, separately for boys and girls in yearly age classes, the mean weights in May 1933, and calculated mean weights in May for the combined years from 1921 to 1927. The means for 1933 are derived from the analysis of frequency distributions of weight made in May and the means for the combined years are derived from data (5) [1] previously published. On the basis of these data an attempt is made to answer the specific question, Is the average weight of school children living in Hagerstown today different from the average weight of their older brothers, sisters, cousins, neighbors, and so on, when the latter were of similar age in the previous decade? The analysis shows that for 6 of the 12 age classes, 6-, 7-, 8-, and 9-year-old boys

TABLE 1.—*Constants of frequency distributions of weight, May 1933. Elementary school children, Hagerstown, Md.*

Age nearest Jan. 1, 1933 (years)	6	7	8	9	10	11
BOYS						
Number	121	200	240	231	234	219
Mean weight (pounds)	46.23	49.73	55.65	60.66	67.98	74.05
Standard deviation (pounds)	5.29	5.70	7.58	7.96	10.78	10.90
GIRLS						
Number	114	205	241	235	233	240
Mean weight (pounds)	44.91	49.19	54.39	58.38	66.20	74.80
Standard deviation (pounds)	5.95	7.17	9.76	10.74	11.30	15.21

TABLE 2.—*Corrected constants of frequency distributions of weight, May 1921–27. Elementary school children, Hagerstown, Md.*

Age nearest Jan. 1, of school year (years)	6	7	8	9	10	11
BOYS						
Number	238	596	839	937	992	868
Mean weight (pounds)	46.83	50.63	55.97	61.57	67.22	73.91
Standard deviation (pounds)	5.32	6.44	7.38	8.71	10.53	12.36
GIRLS						
Number	237	573	811	921	925	798
Mean weight (pounds)	45.78	49.11	54.18	59.50	66.07	74.10
Standard deviation (pounds)	5.34	6.25	7.51	9.25	11.50	14.29

[1] The method of tabulating the 1921–27 data was such that it is not now possible to obtain actual frequency distributions of weight measured in May. In reference (5), however, the means of frequency distributions of weight measured in October during 1921–27 are tabulated, and in addition there are given mean monthly increments of weight for each month from September through May. Thus the mean weight of children in May is obtained by adding the successive mean monthly increments, from October to May, to the mean October weight.

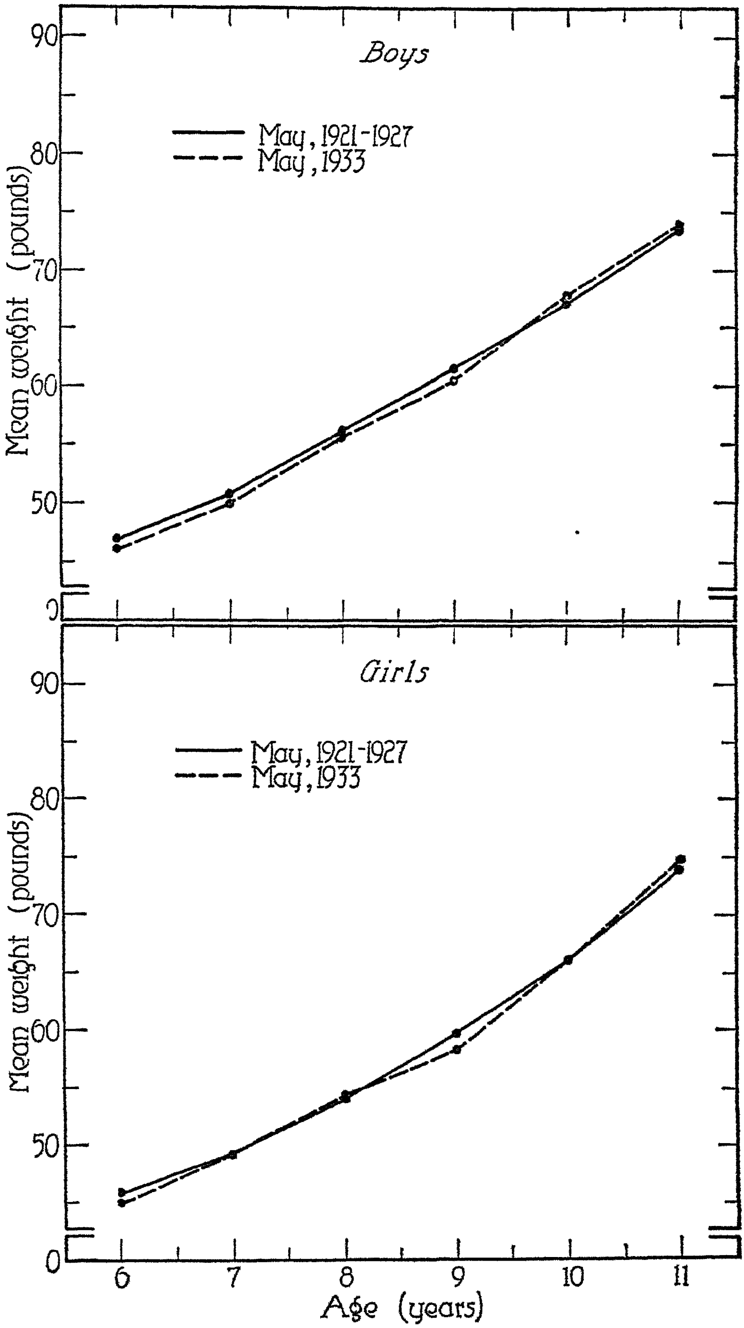

FIGURE 1.—Mean weight of elementary school children from 6 to 11 years of age in 1933 and in 1921-27. (Age at birthday nearest January 1 of school year.)

and 6- and 9-year-old girls, the average size of children is slightly less in 1933 than in 1921–27. However, the lack of consistent differences between the present and former years, together with the small absolute magnitude of these differences, makes it reasonably clear that the average weight of children in Hagerstown has remained fairly constant during the past 12 years. In addition, a test [2] of the statistical significance of the difference between the averages for the present year and those for the previous years shows that differences as great as or greater than those observed might occur once in eight times as the result of the fluctuations of random sampling.

COMPARISON OF STANDARD DEVIATIONS OF WEIGHT IN 1933 AND IN 1921–27

While it appears fairly certain that the average weight of children in Hagerstown in 1933 is substantially the same as that observed for the period between 1921 and 1927, it is not unreasonable to suppose that there may be a difference in the *variability* of weight of children in the two periods. In order to investigate one aspect of this question, tables 1 and 2 and figure 2 give data for the comparison of the standard deviations of the distributions of weight in 1933 with those in 1921–27. Standard deviations for 1933 are calculated directly from distributions of weight measured in May of that year. Comparable standard deviations for the earlier period are obtained, by making slight corrections,[3] from tabulations presented in the previous paper (1).

Study of the data presented shows, certainly so far as boys are concerned, that there are no large or consistent differences between the standard deviations of weight in 1921–27 and in 1933. In no case is the difference between the constants of variability for the separate age groups statistically significant. Comparison of the data for girls is not so conclusive. Except for the 10-year-old group, the standard deviations are larger in 1933 than in the previous years. The differences between the constants for the 7-, 8-, and 9-year-old age groups are fairly large and are statistically significant. There is, therefore, a suggestion that the past few years of economic depression tend to be associated with an increase in the variability of body weight of

[2] The details of the method used to calculate the statistical significance of the difference is given by Wahlund in reference 6.

[3] These corrections are made by arithmetic interpolation from standard deviations of distributions of weight measured in October. Briefly, standard deviations of weight in May are larger than those of the same children in the previous October, due to the dispersing effect of growth. For example, the standard deviation of weight of boys nearest 6 years of age on Jan. 1 and weighed in the previous October (1921–27) is 4.72 pounds while the standard deviation of weight of boys 7 years of age, who may be considered representative of the same boys weighed 1 year later, is 5.63 pounds. Thus, during 1 year of growth, the variability of weight of these boys increased 0.91 pound. A fairly accurate estimation of the standard deviation of weight at any time between the actual dates of weighing, say May, can be obtained by arithmetic interpolation. In the present example, eight twelfths of 0.91 pound plus 4.72 pounds equals 5.32 pounds, the corrected standard deviation of 6-year-old boys in May.

girls. In view of the fact that there is not a consistent difference for girls, and that there are no substantial differences whatever for boys, the evidence must be considered as only mildly suggestive

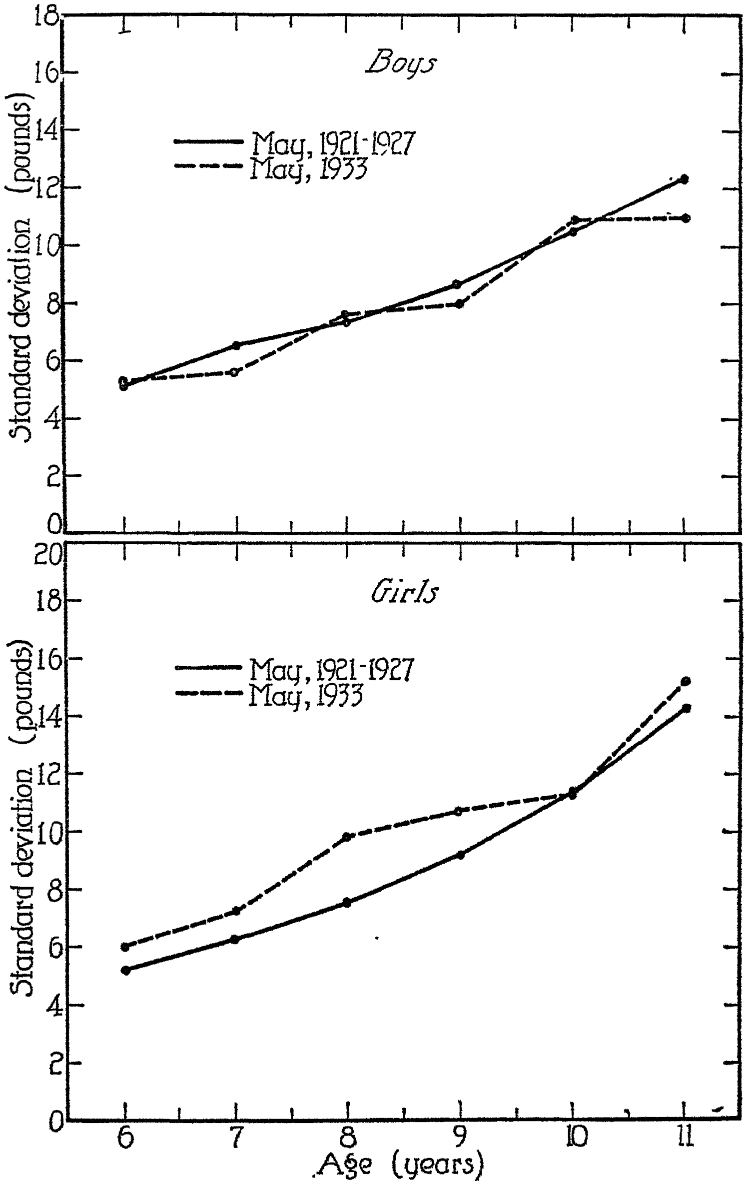

FIGURE 2.—Standard deviations of weight of elementary school children from 6 to 11 years of age in 1933 and in 1921-27. (Age at birthday nearest January 1 of school year.)

COMPARISON OF THE PERCENT OF CHILDREN UNDERWEIGHT IN 1921-27 AND IN 1933

In connection with the discussion of possible changes in the variability of the weight of children, it also is desirable to determine whether or not there has been any change in the proportion of children who may be considered underweight. For the purpose of the analysis, a child is considered underweight if his weight is 12 percent or more below the average for children of the same age and sex. While it is clear that such a definition of underweight is quite arbitrary and may be highly unsatisfactory as an index of nutrition for the individual child, it is, nevertheless, a fairly adequate criterion for measuring the general nutritional status of a reasonably large *group* of children. Furthermore, a comparison of the proportions of underweight children in the population now and a decade ago may give, actually, the most satisfactory answer to the inquiry of whether or not a particular group of children shows to a measurable degree the effects of malnutrition.

TABLE 3.—*Number of children weighed and the percent that were 12 percent or more below the mean weight of children in 1921–27—comparison between 1933 and 1921–27. Elementary school children, Hagerstown, Md.*

Age nearest Jan. 1, of school year (years)	6	7	8	9	10	11
BOYS						
1933						
Number	121	200	240	231	234	219
Percent 12 percent or more below mean weight in 1921–27	17.4	18.0	17.9	18.2	16.8	19.6
1921–27						
Number	238	596	839	987	992	868
Percent 12 percent or more below mean weight in 1921–27	14.5	16.0	15.9	18.5	20.8	22.7
GIRLS						
1933						
Number	114	205	241	236	233	240
Percent 12 percent or more below mean weight in 1921–27	23.6	17.1	22.0	23.7	21.5	27.9
1921–27						
Number	237	573	811	921	925	708
Percent 12 percent or more below mean weight in 1921–27	11.6	13.6	15.6	19.0	23.0	27.9

TABLE 4.—*Number of children observed in 1933 that were 12 percent or more below the mean weight of children in 1921–27 and number of children expected in 1933, on the basis of the proportions, to be 12 percent or more below the mean weight in 1921–27. Elementary school children, Hagerstown, Md.*

Age nearest Jan. 1, 1933 (years)	6	7	8	9	10	11	Total
BOYS							
Number observed in 1933	21	36	43	42	44	43	229
Number expected in 1933	18	32	41	43	49	50	233
GIRLS							
Number observed in 1933	27	35	53	56	50	67	288
Number expected in 1933	13	30	38	45	54	67	247

Data useful for the study of this problem are assembled in tables 3 and 4 and in figure 3. Table 3 and figure 3 show the percentages of children both in 1921–27 and in 1933 that are 12 percent or more below the average. Percentages for the 1921–27 data are obtained from distributions of weight made in October, corrected [4] for differences due to age changes during the interval between October and May. Percentages of underweight children in 1933 are obtained directly from distributions of weight made in May 1933. Calculation of the latter percentages is based on the average weight of children in 1921–27. Thus, for example, the average weight of 6-year-old boys in 1921–27 is 46.83 pounds; 12 percent below this weight is 41.21 pounds; consequently, all 6-year-old boys weighing less than 41¼ pounds in May 1933, are considered underweight.

Turning to the results of the analysis, it will be noted (fig. 3) that within the age limits considered in this study there is a systematic and regular increase with advancing age in the percent of children in the defined underweight classes in 1921–27. During this period less than 12 percent of the 6-year-old girls are classified as underweight, while nearly 28 percent of the 11-year-old girls are so designated. During the same period, there is a gradual increase in the percent of underweight boys from 14.5 percent at 6 years of age to 22.7 percent at 11 years of age. The most striking characteristic which differentiates the percentages underweight in 1933 from those of the previous period is the general lack, in 1933, of a systematic increase in proportions underweight with increasing age. As a result of this difference, there are relatively more younger boys and relatively fewer older boys underweight in 1933 than in 1921–27. Similar differences between the two periods are noted for girls, except that the differences are more marked for the younger girls and are negligible for the older ones. Detailed comparisons between the 1921–27 and the 1933 series for each sex show, except for girls of 6 and 8 years of age, that the differences are not statistically significant for the separate age classes. Furthermore, if the 6-, 7-, and 8-year-old boys are combined into one group, and the 10- and 11-year-old boys are similarly combined, there are still no significant differences between the 1921–27 and 1933 data. If, however, the 6-, 7-, 8-, and 9-year-old girls are considered together, leaving out the 10- and 11-year-old individuals, there is a significantly higher proportion underweight in 1933.

In order to view these results in a slightly different manner, table 4 records the actual number of children observed in the underweight classes in 1933 and the number that would have been observed had the same *proportions* been underweight in the various age-sex groups as

[4] Corrections must be made for these percentages for the same reason that they are made for the standard deviations discussed in the preceding section. Precisely the same method of making the corrections is used in both instances, the method is explained in footnote 3.

were underweight in the 1921–27 period. A total of 229 underweight boys are found in 1933, while 233 would be so classified if the 1921–27 percentages had prevailed in 1933. Since it is clear that no simple method of analyzing the data reveals differences between the two periods that *may* not be accounted for by the fluctuations of random sampling, it must be concluded that the proportions of underweight boys between 6 and 11 years of age is probably the same in 1933 as in 1921–27. The total number of girls found underweight in 1933 is

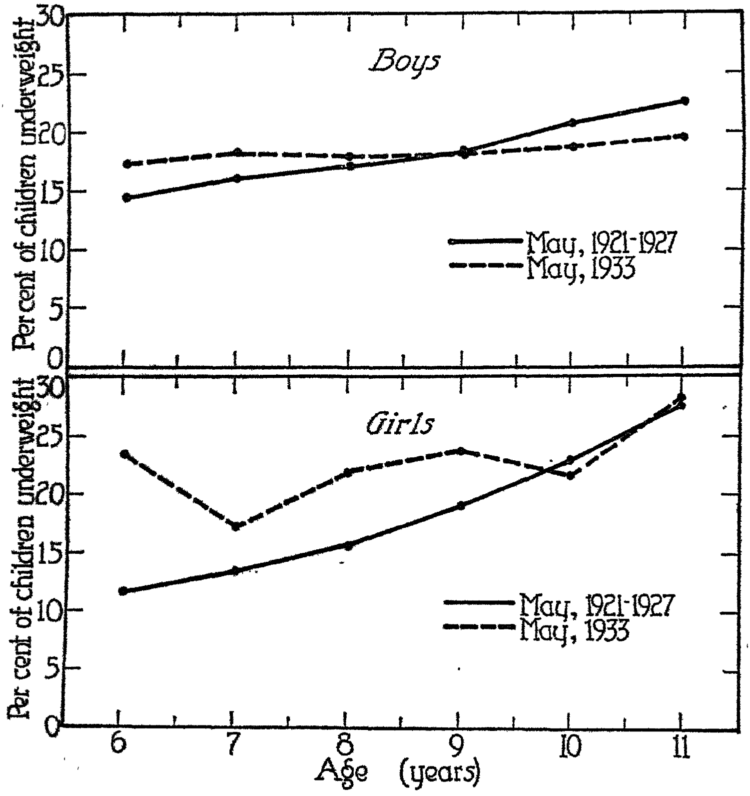

FIGURE 3.—Percentages of elementary school children weighed in 1933 and in 1921–27 that were 12 percent or more below the average weight of children of the same age and sex in 1921–27. (Age at birthday nearest January 1 of school year.)

288, while the total number expected on the basis of the proportions underweight in 1921–27 is 247—an excess of observed over expected of 41 individuals. While the excess is not strikingly great, it is statistically significant, and it may be concluded that the present economic depression is associated with an increase in the proportion of underweight elementary school girls. Taking the boys and girls together and expressing the results in percentages, 20.6 percent of the children are underweight in 1933 while 19.1 percent would have been

so designated had the same age and sex specific proportions been underweight as were observed in 1921–27. The total evidence at hand points to the fact, therefore, that the number of children that are 12 percent or more below the average weight of children in 1921–27 has increased 1.5 percent.

DISCUSSION

Viewing broadly the details so far presented, and taking Hagerstown as more or less typical of the small urban community, which it fairly represents, it is clear that the only unequivocal evidence of a change in weight of elementary school children during the last few years consists of a slight increase in the variability of weight, together with a moderate increase in the proportions underweight, of the younger school girls. Inasmuch as body weight of the young and growing child is usually affected by severe nutritional deficiencies, it may be inferred that the nutritional status of children now is certainly not markedly below that which obtained during the preceding decade. There are, it may be supposed, several obvious reasons why this may be so. First, a well-organized and highly efficient welfare agency, such as exists at Hagerstown, does, in fact, provide the deserving and distressed families with substantial aid. Second, it seems reasonable to believe that in times of stress more attention may be given by the poorer families themselves to dietary matters. Less money, perhaps, is more efficiently spent and more nutritious and wholesome food is purchased.

Although the results of the investigation are fairly conclusive, it is not unreasonable to add that measurements of body weight are perhaps too crude to indicate the effects of malnutrition. It is possible that the true physical status of children must be estimated by more comprehensive and more subtle methods.

COMPARISON OF WEIGHT OF CHILDREN IN DIFFERENT ECONOMIC CLASSES IN 1933

The results of many studies (see a review in reference 7) have shown that the weight of children from families in the poorer economic classes is, on the average, less than the weight of children in other families. Due to the effects of the present depression, it may be supposed that the differences usually observed have materially changed. From one, *a priori*, point of view it is not unlikely that the depression has accentuated the differences and has tended to produce more physically divergent classes. From another point of view it may be supposed that present conditions have rearranged previous economic classifications so that no differences are now observable. Unfortunately no data for Hagerstown, or any similar community, are available which show quantitatively the differences among the

several economic classes in the past decade. Thus, although it is impossible to study the question in great detail, it seems worth while to present such evidence as is available.

TABLE 5.—*Number of children and mean weight, children grouped according to 3 classifications of parents' employment, May 1933. Elementary school children, Hagerstown, Md.*

BOTH SEXES

Age nearest Jan. 1, 1933 (years)		6	7	8	9	10	11
Children, neither of whose parents is employed more than 2 days per week.	Number	26	65	92	89	84	64
	Mean weight (pounds)	43.41	48.05	54.05	57.66	63.85	73.44
Children, 1 of whose parents is employed more than 2 days but less than 4 days per week	Number	24	33	46	43	52	57
	Mean weight (pounds)	45.38	48.09	52.14	58.55	64.76	70.03
Children, 1 of whose parents is employed more than 4 days per week.	Number	185	307	343	335	331	338
	Mean weight (pounds)	45.92	49.90	55.67	60.12	68.28	75.38

Table 5 and figure 4 show, accordingly, the mean weight of children from three groups of families: First, families in which the principal wage earner or earners are unemployed, or, when employed, none

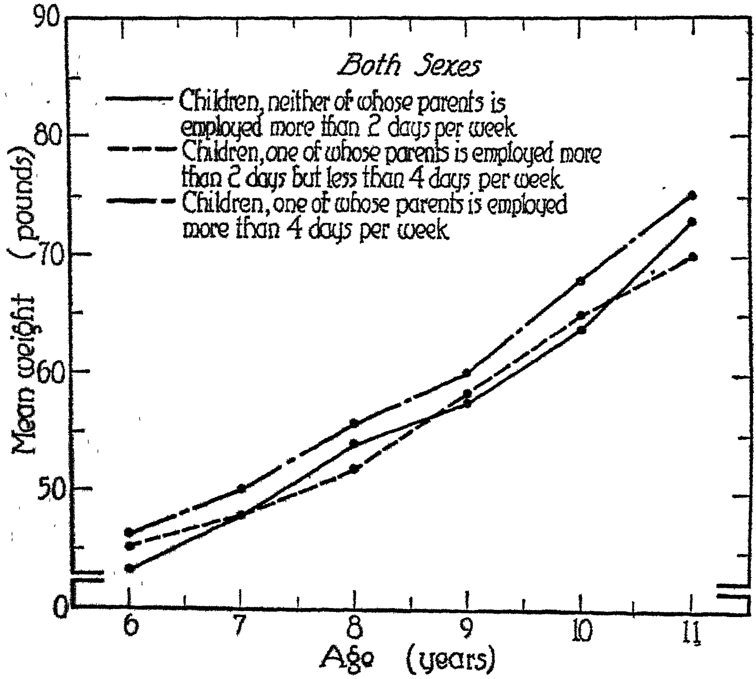

FIGURE 4.—Mean weight of elementary school children from 6 to 11 years of age in 1933, grouped according to three classifications of parents' employment. (Age at birthday nearest January 1, 1933.)

works regularly more than 2 days per week; second, families in which 1 adult person has part-time employment of more than 2 days but less than 4 days of work per week; and third, families in which at

least 1 adult member is regularly employed more than 4 days per week. The number of cases which fall into the first and second groups is small, generally, and because approximately the same number of girls as boys is included in each group it seems justifiable to combine the sexes for this analysis.

Aside from slight irregular fluctuations, it may be seen that the averge weight is greater for children from families of the regularly employed. No consistent differences are shown between the mean weight of children from families of the unemployed and the partially employed. This latter finding, although unexpected, may indicate only that the criterion of selection does not definitely differentiate the two groups. It may be argued that unemployed families are generally receiving aid from the welfare agency and that such aid places them on an equal economic level with families in which some person has part-time employment. Taking groups 1 and 2 together, therefore, it is seen that the weights of children in families of the regularly employed are from 1.5 to 4 pounds, on the average, heavier than children in families less fortunately situated. In general, this is approximately the same difference which is usually found between higher and lower economic classes (7), and it may be concluded that present economic conditions have tended neither to produce striking class differences nor to obliterate the differences previously observed.

COMPARISON OF THE WEIGHT OF CHILDREN RECEIVING AND NOT RECEIVING WELFARE AID

Further study of the records collected in 1933 leads to interesting results concerning the dispensation of welfare funds and consists of the comparison of the weight of children separated into two groups: First, those children who either receive free lunches at school or whose families are receiving welfare aid; second, those children who are not eligible for free lunches and whose families do not receive aid. Data for the comparison of the two groups are recorded in table 6 and are shown graphically in figure 5. At each age the average weight is less for children who, directly or indirectly, are receiving aid. The differences between the two groups range from 2.5 to 9 pounds, and in general these differences are statistically significant for the individual age and sex classes. Since it is generally accepted that children in the lower economic classes are smaller, on the average, than children in the higher economic classes, it may be concluded that a welfare agency which gives its funds toward the support of children who average from 2.5 to 9 pounds below the weight of other children in the same community is, in fact, probably giving aid to those children who are actually most in need of it.

TABLE 6.—*Number of children and mean weight, children classified according to whether or not they received aid from the welfare society. Elementary school children, Hagerstown, Md.*

Age nearest Jan. 1, 1933 (years)		6	7	8	9	10	11
BOYS							
Children receiving free lunch or whose families receive aid.	Number	26	70	44	61	49	48
	Mean weight (pounds)	43.65	47.56	52.60	57.96	63.24	69.71
Children not receiving free lunch or whose families do not receive aid.	Number	95	130	196	170	185	171
	Mean weight (pounds)	46.94	50.89	56.34	61.63	69.23	75.27
GIRLS							
Children receiving free lunch or whose families receive aid.	Number	28	51	67	65	54	50
	Mean weight (pounds)	41.88	47.35	52.64	55.37	63.25	67.80
Children not receiving free lunch or whose families do not receive aid.	Number	86	154	174	171	179	190
	Mean weight (pounds)	45.90	49.80	55.07	59.53	67.09	76.64

SUMMARY

The study reported in this paper was undertaken for the explicit purpose of determining whether or not the weight of elementary school children in Hagerstown, Md., differs today in significant particulars from the weight of children of the same sex and age and living in the same city during the past decade. Data for the study were collected at Hagerstown during two periods; first, each year during the interval between 1921 and 1927, and second, in May 1933. Analysis of these data in sex and age specific distributions and comparisons of the statistical constants derived show the following:

1. Average weight of children in the two periods presents no consistent or statistically significant differences.
2. The variability of body weight (measured by the standard deviation) is not, for boys, consistently different for the two periods. For girls, body weight is slightly more variable in 1933 than in 1921–27.
3. In the totals of 1,245 boys and 1,269 girls weighed in 1933, there are 4 fewer boys and 41 more girls who are 12 percent or more below average weight than would be expected had the same proportions been underweight as were found in the 1921–27 period.

From these findings it may be concluded that there is substantially no change in the weight of boys, and a slight increase in the number of underweight girls, during the last few years of the economic depression.

Classification of the children weighed in 1933 into three groups, (*a*) those from families of the unemployed, (*b*) from families of the part-time employed, and (*c*) from families of the regularly employed, with subsequent analysis of the weight of children in these groups, shows approximately the same differences as are generally found between children from different socio-economic classes. It is concluded

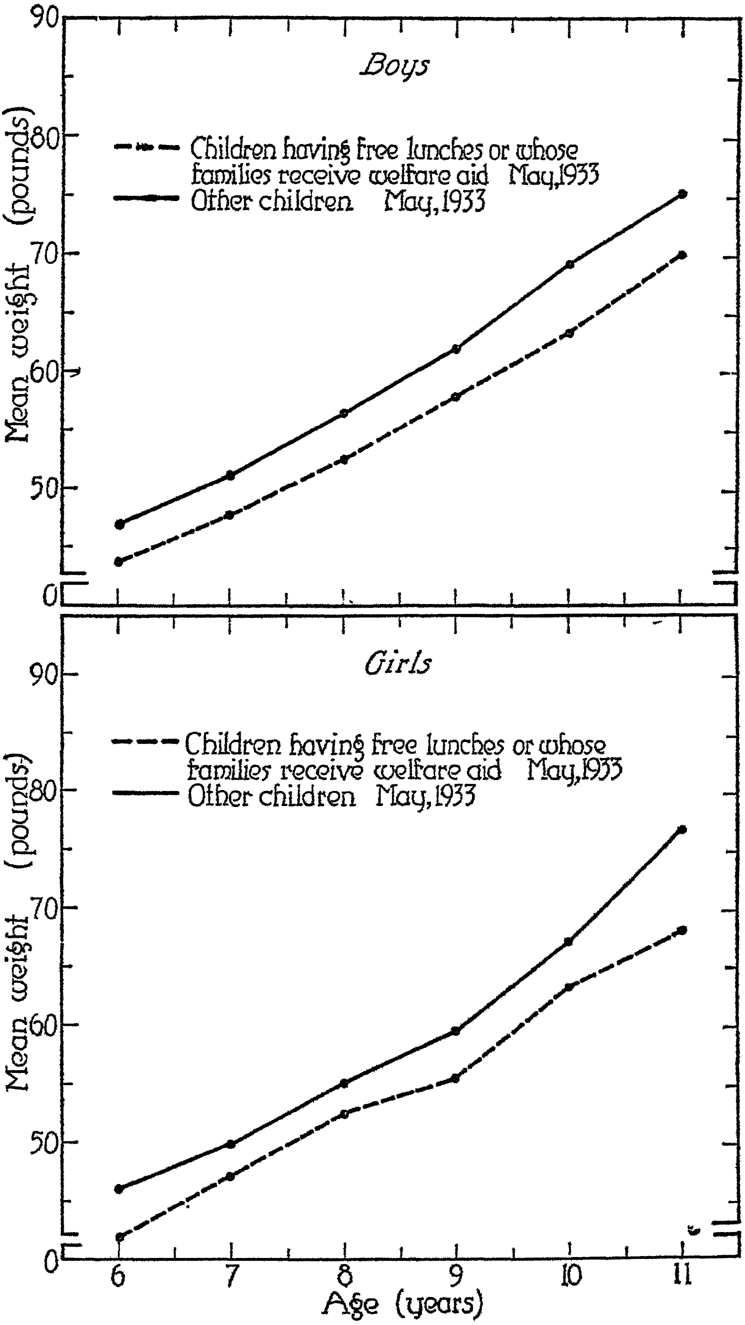

FIGURE 5.—Mean weight of elementary school children from 6 to 11 years of age in 1933, classified according to whether or not the child received aid from the welfare society. (Age at birthday nearest January 1, 1933.)

therefore, that there has been no obliteration nor widening of class differences during the period of the depression. A separate classification of the children into two groups, one, those who are directly or indirectly receiving aid from charity funds, and the other, those not receiving such aid, shows that children in the first group are from 2.5 to 9 pounds lighter, on the average, than those in the latter. Thus it is inferred that those children who are most in need of supplementary aid are probably receiving it.

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COMPARISON OF THE ENUMERATION OF BACTERIA BY MEANS OF SOLID AND LIQUID MEDIA

By C. T. Butterfield, *Principal Bacteriologist, Stream Pollution Investigations, United States Public Health Service, Cincinnati, Ohio*

In conducting bacteriological researches both qualitative and quantitative methods are essential. Quantitative methods inherently require a greater attention to detail and a consideration of the various factors which might affect the numerical accuracy of the results obtained. When more than one method is used for making the same quantitative determination, or when one method is substituted for another, carefully controlled comparative studies should be made to determine the relative accuracy of the different methods.

There are in use three general methods for the quantitative determination of bacteria. These fundamental procedures may be described as the direct count, the plate colony count, and the dilution method. Several variations of each of these procedures are in com-

mon use. Each method has certain features which make it a desirable procedure for a particular type of determination. Similarly, each method is subject to certain limitations and errors which limit its use and the value of the results obtained.

In the direct counting procedure the individual bacterial cells in portions of the sample are actually counted. This procedure has the following advantages: (1) It gives an exact count of the organisms in a sample regardless of their ability to grow in a given media or under fixed conditions of incubation, and (2) the count can be obtained immediately following the collection of the sample rather than after a delay of 24 hours or longer. Limitations which affect this procedure are as follows: (1) There is no satisfactory method applicable to this direct examination for differentiating between living and dead bacteria; (2) the procedure is applicable only to samples which contain fairly large numbers of bacteria, as the portion of a sample examined is very small; (3) samples are not suitable for examination which contain any foreign material that might appear as confusing artifact simulating bacteria; and (4) where the bacteria have a tendency to clump or grow in masses, it is exceedingly difficult to make accurate estimations.

With the plate colony count procedure, counts are made of the bacterial colonies which develop on some solid plating media under standard conditions of incubation. With this procedure, estimations can be made on samples with a very low bacterial content, as any amount of a sample can be planted. Only living bacterial cells will produce colonies. At least two limitations on its accuracy must be considered: (1) Only bacteria which are able to grow on the media selected and under the conditions of incubation will produce visible colonies, and (2) the presumption that each colony represents an individual in the sample cannot be true when the bacteria occur in the sample in clumps of two or more.

The dilution procedure, in which a series of portions of a sample varying in size are planted in tubes of liquid media, depends for its interpretation on having the series of portions sufficiently extended so that positive results will be obtained in the lower dilutions and negative results in the higher dilutions. Any test which does not satisfy this condition is indeterminate. This procedure offers certain advantages which have made it a favorite for particular tests. It supplies the bacteria with a liquid media which is probably the ideal for bacterial growth; it is used in tubes which are easily handled and readily protected from contamination; and it makes some provision for simultaneous qualitative tests, such as acid, gas, or nitrite production. The chief limitation of this procedure is the questionable accuracy of the quantitative interpretation of the results.

In bacteriological work the plate colony count and the dilution method are the procedures usually employed for quantitative determinations. Frequently the results obtained by each method are used comparatively and in relation to some established standard. While it is generally recognized that the colony count procedure should be the more accurate method of enumeration, it is possible that the results obtained with it may deviate consistently from those obtained with the other procedure. Such deviations, if they were of sufficient magnitude, might affect the significance of the results which were being compared with established standards.

To investigate the possible relationship existing between the results of bacteriological analyses made by these two methods for the quantitative determination of bacteria, a series of tests has been made on suspensions of *Bact. coli* and of *Bact. aerogenes* under standardized conditions.

Suspensions of *Bact. coli* and of *Bact. aerogenes*, each in pure culture, were prepared by making appropriate dilutions of cultures with sterile dilution water. Effort was made to adjust these dilutions so that the suspensions used in each test would contain from 50 to 200 living bacteria per cubic centimeter. These suspensions were shaken vigorously each time before a portion was removed for planting. During this period of examination the suspensions were kept at room temperature which ranged from 21° to 24° C.

Nutrient agar for the plate count procedure and lactose broth for the dilution method were the media employed. They were prepared in accordance with the instructions given in Standard Methods (1925) (1). All inoculated plates were incubated for 24 hours at 37° C. before counting, and broth tubes were incubated for 48 hours at 37° C., with examinations for confirmation at the 24- and 48-hour periods.

One-cc portions of the suspensions were used for each plate inoculated, while for the tubes of liquid media, portions of one tenth, one hundredth, and one thousandth of a cubic centimeter of the suspensions were employed. Fifty plates were planted from each suspension for the plate colony count and 50 tubes were inoculated from each dilution for the estimate by the dilution method. In actual practice in carrying out the tests, 25 plates were inoculated and poured first; then all the broth tubes were inoculated, and finally the second set of 25 plates was prepared. It was thought that by inoculating plates before and after the broth tubes were inoculated, a measure would be obtained of the accuracy of the method and of any change in the number of living bacterial cells in the suspensions that might occur during the examination interval.

Arithmetical averages were computed of the plate colony count results. These averages include, in addition to the final average,

separate averages for the 25 plates planted before, and the 25 plates planted after the broth tubes were inoculated. The most probable number figures, with results from 50 tubes at each dilution, were calculated according to the theory of probability, using the tables and procedure given by Hoskins (2). It is believed that, with the use of 50 plates for the colony counts and 50 tubes at each dilution with the dilution method, the results are sufficiently accurate to warrant their use for comparative purposes. The average results for the plate colony counts of the *Bact. coli* and the *Bact. aerogenes* suspensions are presented in table 1.

TABLE 1.—*Average colony counts of Bact. coli and Bact. aerogenes obtained from standard nutrient agar plates, showing (1) averages of 25 plates made before broth tubes were inoculated, (2) averages of 25 plates made after broth tubes were inoculated, and (3) grand average of both sets of plates*

Test no.	Bact. coli results			Test no.	Bact. aerogenes results		
	(1) Before	(2) After	(3) Final		(1) Before	(2) After	(3) Final
1	103.5	102.9	103.2	8	58.1	50.1	54.1
2	226.5	209.9	218.2	9	63.4	59.7	61.6
3	157.2	161.0	159.1	10	66.2	62.8	64.5
4	76.5	80.9	78.7	11	74.4	68.7	71.6
5	76.1	75.7	75.9	12	57.5	58.8	58.2
6	62.9	63.4	63.2	13	66.9	67.2	67.0
7	65.8	65.7	65.8	14	106.2	103.6	104.9
Average	109.8	108.5	109.2	Average	70.4	67.3	68.8

Differences between the averages for the plates planted before and after the broth tubes were inoculated are so small that it is safe to assume that no appreciable change in bacterial numbers occurred in the suspensions during the examination period. In fact, in 5 of the 14 tests, the average counts of the 25 plates planted after the broth tubes were inoculated were slightly greater than the corresponding average for the first set of plates. The differences observed were of a magnitude of 10 percent in only one case (test no. 8 with *Bact. aerogenes*). This agreement between the averages for the two sets of counts would indicate a fair degree of accuracy for the final average, which includes the results from both sets.

The results obtained from the broth tubes inoculated from the *Bact. coli* suspensions are presented in table 2, and those from the *Bact. aerogenes* suspensions in table 3. These tables also contain (1) the most probable number figures obtained by calculation from the broth tube results; (2) the average plate counts obtained from the same suspensions; and (3) the ratio of the most probable number results to the corresponding average plate count results.

TABLE 2.—*Comparison of the numbers of Bact. coli as determined by the plate colony count procedure, using standard nutrient agar and by the dilution method using standard lactose broth*

Test no.	Portions in lactose broth						Most probable number (M.P.N.)	Average plate count (P.C.)	Ratio, M.P.N./P.C.
	0.1 cc		0.01 cc		0.001 cc				
	+	−	+	−	+	−			
1	50	0	32	18	8	42	112	103	1.08
2	50	0	44	6	8	42	203	218	0.93
3	50	0	41	9	6	44	163	159	1.02
4	50	0	35	15	9	41	132	79	1.67
5	50	0	28	22	1	49	74	76	0.97
6	50	0	24	26	5	45	71	63	1.12
7	49	1	27	23	6	44	67	66	1.01
Total							822	764	7.80
Average							117	109	1.11

TABLE 3.—*Comparison of the numbers of Bact. aerogenes as determined by the plate colony count procedure using standard nutrient agar and by the dilution method using standard lactose broth*

Test no.	Portions in lactose broth						Most probable number (M.P.N.)	Average plate count (P.C.)	Ratio, M.P.N./P.C.
	0.1 cc		0.01 cc		0.001 cc				
	+	−	+	−	+	−			
8	50	0	30	20	5	45	94	54	1.74
9	50	0	30	20	4	46	91	62	1.47
10	50	0	38	12	1	49	121	65	1.86
11	50	0	22	28	6	44	67	72	0.93
12	50	0	19	31	4	46	55	58	0.95
13	50	0	31	19	2	48	89	67	1.33
14	50	0	37	13	6	44	131	105	1.28
Total							651	483	9.56
Average							93	69	1.37

The most probable number figures obtained by calculation from these results, where 50 tubes were employed at each dilution, were very sharply defined, indicating a decided accuracy for this procedure. In comparing the counts obtained from the *Bact. coli* suspensions by the two methods under examination, very excellent agreement is noted in six of the seven tests. In only one test (no. 4) was a marked difference observed. Consequently, although the results obtained by the dilution method in five of the seven tests exceeded the corresponding plate colony counts, the average ratio of the most probable number estimations to the plate colony counts was 1.11. This figure indicates a very excellent agreement between these two methods under the conditions of these tests for the determination of *Bact. coli*.

When the counts obtained with the *Bact. aerogenes* suspensions (table 3) are studied, the agreement observed between the results secured by the two methods, while fair, is not nearly as satisfac

tory as in the case of the *Bact. coli* determinations. In two tests (no. 11 and no. 12) the agreement is almost perfect. However, in the other five tests the average plate counts are less than the most probable number figures by from 22 to 46 percent. The average ratio of the most probable number figures to the plate counts for the seven tests with *Bact. aerogenes* is 1.37.

The reason for this greater divergence in the results obtained for *Bact. aerogenes* with the two methods is not known. It is possible that there is a greater tendency for the aerogenes cells to clump, owing to the presence of mucoid substances which they frequently produce, and that the greater dilution required to obtain quantitative results by the dilution method tends to loosen and disintegrate the cells which make up these clumps.

Under the standardized conditions of these tests, the plate colony counts and the most probable numbers computed from the dilution method are in excellent agreement for the quantitative determination of *Bact. coli*, and are in fair agreement for *Bact. aerogenes*. This would indicate that, under the conditions of these tests, the two methods could be interchanged without interfering materially with the numerical value of the results. Moreover, the procedures followed in these comparative tests have proved so satisfactory that their use is suggested in future studies to determine the relative accuracy of other media.

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COURT DECISION RELATING TO PUBLIC HEALTH

Beauty culture law upheld and construed.—(Minnesota Supreme Court; *Luzier Special Formula Laboratories v. Minnesota State Board of Hairdressing and Beauty Culture Examiners et al.*, 248 N.W. 664; decided May 19, 1933.) The plaintiff, a Missouri corporation, manufactured cosmetic preparations in that State and sold them in Minnesota. Its salesmen promoted sales through demonstrating the use of such goods by applying the same to the upper parts of the bodies of prospective customers, the salesmen being compensated only by the plaintiff. The plaintiff sought to enjoin the prosecution of its salesmen, such prosecutions being based on the ground that the salesmen, not being licensed under the statute requiring the licensing of hairdressers and beauty culturists, were violating such statute. The decision of the supreme court was to the effect that such conduct

on the part of the salesmen constituted a violation of the law in question. Other points decided by the court may be summarized as follows:

(1) While hairdressing and beauty culture was a lawful occupation, it was subject to regulation under the police power.

(2) The statute involved was not aimed at more than one vocation and, hence, was not objectionable on the ground of prohibiting a person from engaging in one of several occupations unless he qualified to engage in all.

(3) The law did not embrace more than one subject.

(4) The law did not interfere with the interstate commerce which the plaintiff carried on in Minnesota, as it was free to sell its goods everywhere but could not carry on the occupation of beauty culturist by its salesmen unless they were licensed.

DEATHS DURING WEEK ENDED SEPT. 30, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Sept. 30, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	7,118	6,589
Deaths per 1,000 population, annual basis	10.0	9.4
Deaths under 1 year of age	532	561
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	47	47
Deaths per 1,000 population, annual basis, first 39 weeks of year	10.9	11.2
Data from industrial insurance companies:		
Policies in force	67,661,518	70,415,889
Number of death claims	11,704	11,909
Death claims per 1,000 policies in force, annual rate	9.0	8.8
Death claims per 1,000 policies, first 39 weeks of year, annual rate	9.8	9.6

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended October 7, 1933, and October 8, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Oct. 7, 1933, and Oct. 8, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Oct. 7, 1933	Week ended Oct. 8, 1932	Week ended Oct. 7, 1933	Week ended Oct. 8, 1932	Week ended Oct. 7, 1933	Week ended Oct. 8, 1932	Week ended Oct. 7, 1933	Week ended Oct. 8, 1932
New England States:								
Maine	1	2		5	3	2	0	0
New Hampshire	1	2				1	0	0
Vermont		1				1	0	0
Massachusetts	24	29		4	34	22	1	3
Rhode Island	3	5					0	0
Connecticut		5		5	5	5	0	0
Middle Atlantic States:								
New York	30	63	[1] 10	[1] 9	82	125	2	4
New Jersey	9	26	8	13	19	58	0	1
Pennsylvania	51	76			34	41	4	2
East North Central States:								
Ohio	50	82	4	5	7	19	0	0
Indiana	65	42	31	23	5	22	2	12
Illinois	38	138	13	12	6	21	2	6
Michigan	17	12	4	3	8	38	0	2
Wisconsin	9	19	34	23	16	39	1	1
West North Central States:								
Minnesota	14	16	2		2	60	0	0
Iowa [2]	14	11			2	1	0	1
Missouri [2]	80	54	3	2		8	1	4
North Dakota	3				3	6	0	0
South Dakota	3	2		1	10		0	0
Nebraska	6	32	7	3	1	14	1	0
Kansas	21	35		2	5	2	0	0
South Atlantic States:								
Delaware		1					0	0
Maryland [2]	8	26	12	8	1		0	0
District of Columbia	8	8	1		1	1	0	0
Virginia	91	65			5	45	1	2
West Virginia	90	67	25	4	4	7	0	0
North Carolina	127	84	12	17	18	22	0	1
South Carolina [3]	34	24	192	285	14	23	0	0
Georgia [3]	60	73		19	15	2	0	1
Florida [3]	10	17		2		1	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Oct. 7, 1933, and Oct. 8, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Oct. 7, 1933	Week ended Oct. 8, 1932	Week ended Oct. 7, 1933	Week ended Oct. 8, 1932	Week ended Oct. 7, 1933	Week ended Oct. 8, 1932	Week ended Oct. 7, 1933	Week ended Oct. 8, 1932
East South Central States:								
Kentucky	116	81	23				0	1
Tennessee	95	112	13	15	26	1	1	2
Alabama [3]	78	119	28	14	4	1	0	0
Mississippi [3]	42	40					0	1
West South Central States:								
Arkansas	36	42	1	10	16	4	0	0
Louisiana	32	37	2	14	2	2	0	0
Oklahoma [4]	76	95	19	26		1	0	1
Texas [3]	110	151	109	50	12		5	0
Mountain States:								
Montana	1			2	1	93	1	0
Idaho		1	1				0	1
Wyoming					1		0	0
Colorado	7	10			2	2	1	0
New Mexico	12	8	3	9	8		0	0
Arizona	2	3		1	2	1	0	0
Utah [3]	3	1		1	4	4	0	0
Pacific States:								
Washington	11	11			42	2	0	0
Oregon		2	19	141	8	28	0	0
California	18	58	38	166	134	29	1	1
Total	1,509	1,788	814	903	562	759	24	47

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Oct. 7, 1933	Week ended Oct. 8, 1932	Week ended Oct. 7, 1933	Week ended Oct. 8, 1932	Week ended Oct. 7, 1933	Week ended Oct. 8, 1932	Week ended Oct. 7, 1933	Week ended Oct. 8, 1932
New England States:								
Maine	3	12	11	17	0	0	2	3
New Hampshire	1	0	19	7	0	0	0	0
Vermont	1	0	6	8	0	0	0	0
Massachusetts	8	3	99	158	0	0	6	5
Rhode Island	1	0	9	31	0	0	8	2
Connecticut	5	0	26	38	0	0	2	3
Middle Atlantic States:								
New York	59	17	140	210	0	0	37	55
New Jersey	20	23	59	99	0	0	7	18
Pennsylvania	28	61	226	161	0	0	59	71
East North Central States:								
Ohio	10	2	229	276	0	1	27	69
Indiana	4	3	99	78	0	0	17	30
Illinois	12	7	161	201	1	3	21	44
Michigan	4	3	125	146	0	1	17	22
Wisconsin	3	2	36	32	2	3	6	6
West North Central States:								
Minnesota	27	5	39	48	0	1	7	6
Iowa [3]	4	3	48	34	0	1	5	13
Missouri [3]	2	0	71	102	0	0	22	39
North Dakota	1	2	8	1	0	2	5	6
South Dakota	3	0	11	14	0	0	5	0
Nebraska	0	1	7	84	0	3	1	1
Kansas	1	2	77	63	0	1	12	7
South Atlantic States:								
Delaware	1	0	6	6	0	0	1	4
Maryland [3]	5	1	45	50	0	0	31	36
District of Columbia	2	3	5	4	0	0	2	2
Virginia	4	1	108	62	0	0	21	21
West Virginia	5	1	132	72	1	0	66	74
North Carolina	0	2	84	71	0	1	22	8
South Carolina [3]	0	0	9	4	0	0	35	20
Georgia [3]	0	0	16	37	0	0	11	22
Florida [3]	0	0	1	7	0	0	1	2

[3] See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Oct. 7, 1933, and Oct. 8, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Oct. 7, 1933	Week ended Oct. 8, 1932	Week ended Oct. 7, 1933	Week ended Oct. 8, 1932	Week ended Oct. 7, 1933	Week ended Oct. 8, 1932	Week ended Oct. 7, 1933	Week ended Oct. 8, 1932
East South Central States:								
Kentucky	5	3	105	81	0	0	37	29
Tennessee	6	5	101	75	0	1	30	31
Alabama [3]	0	2	38	66	0	0	13	22
Mississippi [2]	0	5	18	30	0	0	4	6
West South Central States:								
Arkansas	0	0	17	22	1	0	15	21
Louisiana	1	6	8	10	0	2	11	9
Oklahoma [4]	2	0	7	36	2	2	46	30
Texas [3]	1	4	33	46	12	3	70	29
Mountain States:								
Montana	0	0	19	4	0	0	11	1
Idaho	0	0	5	1	0	0	3	10
Wyoming	2	0	5	6	1	0	0	1
Colorado	0	0	8	26	8	0	8	12
New Mexico	0	1	14	13	1	0	31	15
Arizona	0	0	4	7	0	0	2	2
Utah [2]	0	0	6	1	0	0	2	2
Pacific States:								
Washington	5	3	22	33	2	7	8	8
Oregon	4	0	21	18	4	2	14	9
California	4	5	128	88	6	4	22	13
Total	244	188	2,462	2,634	41	38	778	839

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Oct. 7, 1933, 40 cases, as follows: South Carolina, 3; Georgia, 18; Florida, 1; Alabama, 12; Texas, 6.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
July 1933										
Massachusetts	8	66		4	1,164	1	78	418	0	20
August 1933										
Florida	1	48	3	265	91	9	0	5	0	23
Massachusetts	7	63		4	240	1	148	271	0	25
Mississippi		107	608	12,832	188	642	1	36	6	98
New Hampshire		1					1	19	0	0
Nevada		1					1		0	2
South Carolina		138	289	1,173	126	235	3	12	8	129
September 1933										
Arkansas		81	7	755	39	17	1	25	1	42
Connecticut	2	11	5	2	17		35	57	0	12
District of Columbia	1	35			7		5	30	0	17
Massachusetts	1	58		4	80		83	292	0	23
Missouri	3	163	29	95	40		10	209	8	83
New Jersey	4	51	23		54	1	100	158	0	27
North Dakota	1	17	3		36		28	33	1	8
Vermont		1			14		9	23	0	1

July 1933

	Cases
Massachusetts	
Chicken pox	342
German measles	35
Lead poisoning	2
Lethargic encephalitis	4
Mumps	208
Ophthalmia neonatorum	67
Paratyphoid fever	2
Septic sore throat	17
Tetanus	4
Trachoma	4
Undulant fever	1
Whooping cough	654

August 1933

	Cases
Chicken pox:	
Florida	2
Massachusetts	125
Mississippi	159
South Carolina	12
Dengue:	
Mississippi	28
South Carolina	3
Diarrhea:	
South Carolina	613
Dysentery:	
Florida	1
Massachusetts	3
Mississippi (amebic)	88
German measles:	
Massachusetts	25
Hookworm disease:	
Mississippi	723
South Carolina	86
Lead poisoning:	
Massachusetts	2
Lethargic encephalitis:	
Florida	1
Massachusetts	3
South Carolina	3
Mumps:	
Florida	7
Massachusetts	103
Mississippi	48
South Carolina	13
Ophthalmia neonatorum:	
Massachusetts	27
South Carolina	6
Paratyphoid fever:	
Massachusetts	2
South Carolina	8
Puerperal septicemia:	
Mississippi	24
Rabies in animals:	
Mississippi	1
South Carolina	7
Rocky Mountain spotted fever:	
Nevada	1

August 1933—Continued

	Cases
Septic sore throat:	
Massachusetts	18
Tetanus:	
Massachusetts	3
Trachoma	
Massachusetts	2
Mississippi	1
Trichinosis:	
Massachusetts	2
Tularaemia:	
South Carolina	1
Typhus fever:	
Florida	9
South Carolina	9
Undulant fever:	
Florida	2
Massachusetts	2
Mississippi	3
South Carolina	1
Vincent's angina:	
South Carolina	7
Whooping cough:	
Florida	44
Massachusetts	686
Mississippi	577
South Carolina	182

September 1933

	Cases
Anthrax:	
Missouri	1
New Jersey	1
Chicken pox:	
Arkansas	16
Connecticut	33
District of Columbia	1
Massachusetts	81
Missouri	10
New Jersey	72
North Dakota	22
Vermont	21
Conjunctivitis:	
Connecticut	1
Dysentery:	
Connecticut (bacillary)	5
Massachusetts	5
Missouri	1
New Jersey	5
North Dakota	1
German measles:	
Connecticut	2
Massachusetts	10
New Jersey	16
North Dakota	1
Impetigo contagiosa:	
North Dakota	14
Lead poisoning:	
Connecticut	3
Massachusetts	3
New Jersey	1
Leprosy:	
New Jersey	1

September 1933—Continued

	Cases
Lethargic encephalitis:	
Arkansas	1
Connecticut	6
District of Columbia	1
Missouri	1,132
New Jersey	6
North Dakota	2
Mumps:	
Arkansas	7
Connecticut	50
Massachusetts	98
Missouri	26
New Jersey	61
North Dakota	2
Vermont	29
Ophthalmia neonatorum:	
Massachusetts	127
North Dakota	1
Paratyphoid fever:	
Arkansas	1
Massachusetts	3
New Jersey	1
Rabies in animals:	
Connecticut	6
Missouri	14
New Jersey	12
Rabies in man:	
Massachusetss	1
Missouri	1
Scabies:	
North Dakota	4
Septic sore throat:	
Connecticut	12
Massachusetts	9
Missouri	15
Tetanus:	
Connecticut	3
Massachusetts	5
New Jersey	4
Trachoma:	
Arkansas	2
Massachusetts	2
North Dakota	1
Trichinosis:	
Connecticut	1
New Jersey	1
Tularaemia:	
Arkansas	1
Undulant fever:	
Connecticut	6
Missouri	2
Vermont	1
Vincent's angina:	
North Dakota	6
Whooping cough:	
Arkansas	16
Connecticut	126
District of Columbia	25
Massachusetts	500
Missouri	126
New Jersey	415
North Dakota	31

WEEKLY REPORTS FROM CITIES

City reports for week ended Sept. 30, 1933

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Maine:											
Portland	0	------	0	2	1	0	0	0	1	12	24
New Hampshire:											
Concord	0	------	0	0	0	0	0	0	0	0	8
Nashua	0	------	0	0	0	3	0	0	0	0	------
Vermont:											
Barre	0	------	0	1	0	0	0	0	0	1	3
Burlington	0	------	0	1	0	3	0	0	0	0	13
Massachusetts:											
Boston	6	------	0	4	11	27	0	7	1	31	205
Fall River	2	------	0	0	1	0	0	4	0	3	25
Springfield	0	------	0	1	0	0	0	0	0	1	28
Worcester	0	------	0	8	1	2	0	1	0	17	43

City reports for week ended Sept. 30, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Rhode Island:											
Pawtucket	3	------	0	0	0	3	0	0	0	0	22
Providence	0	------	0	2	4	9	0	2	0	28	46
Connecticut:											
Bridgeport	0	------	0	1	0	0	0	0	0	2	23
Hartford	3	------	0	0	2	3	0	0	0	1	33
New Haven	0	------	0	0	0	2	0	1	0	2	28
New York:											
Buffalo	1	------	0	2	2	13	0	5	3	28	113
New York	28	7	3	6	90	52	0	80	18	129	1,341
Syracuse	0	------	0	0	3	1	0	3	0	28	47
New Jersey:											
Camden	4	------	0	0	2	2	0	0	1	0	24
Newark	0	3	0	0	4	4	0	3	0	38	88
Trenton	0	------	0	1	1	0	0	1	1	5	37
Pennsylvania:											
Philadelphia	1	4	2	2	16	31	0	18	4	23	403
Pittsburgh	0	------	0	1	7	13	0	3	0	28	116
Reading	1	------	0	0	1	1	0	0	0	3	21
Ohio:											
Cincinnati	3	1	0	2	2	20	0	6	5	2	104
Cleveland	5	22	1	1	6	29	0	7	0	39	156
Columbus	6	------	0	0	3	14	0	1	1	5	75
Toledo	1	------	0	0	0	15	0	4	0	4	61
Indiana:											
Fort Wayne	4	------	0	0	0	1	0	0	1	0	23
Indianapolis	0	------	0	0	12	7	0	1	0	8	83
South Bend	0	------	0	2	0	3	0	0	0	1	16
Terre Haute	0	------	0	0	1	2	0	0	0	0	15
Illinois:											
Chicago	13	1	2	4	25	29	0	29	4	57	571
Springfield	1	------	0	0	1	3	0	0	1	0	21
Michigan:											
Detroit	9	4	1	4	8	27	0	14	3	79	206
Flint	1	------	0	1	1	6	0	0	0	7	21
Grand Rapids	0	------	1	0	0	1	0	0	0	1	26
Wisconsin:											
Kenosha	0	------	0	0	1	1	0	0	0	1	8
Madison	[1] 2	------	0	1	0	0	0	0	0	2	22
Milwaukee	2	1	1	1	4	7	0	4	1	75	95
Racine	0	------	0	1	0	2	0	0	0	7	11
Superior	0	------	0	0	0	1	0	0	0	6	10
Minnesota:											
Duluth	0	------	0	1	1	0	0	2	0	0	21
Minneapolis	1	------	0	1	5	3	0	0	0	9	92
St. Paul	1	------	0	0	4	1	0	1	0	17	55
Iowa:											
Des Moines	0	------	0	0	0	9	0	0	0	8	27
Sioux City	0	------	0	1	0	[1] 5	0	0	0	4	------
Waterloo	0	------	0	0	0	0	0	0	0	1	------
Missouri:											
Kansas City	3	------	0	0	6	7	0	4	2	4	101
St. Joseph	6	------	0	0	2	1	0	2	0	0	27
St. Louis	5	------	0	1	3	5	0	15	3	4	212
North Dakota:											
Fargo	0	------	0	0	0	0	0	0	0	0	8
South Dakota:											
Aberdeen	0	------	0	0	0	0	0	0	0	0	------
Nebraska:											
Omaha	3	------	0	0	3	4	0	1	0	0	56
Kansas:											
Topeka	0	1	1	0	2	0	0	1	0	5	14
Wichita	1	------	0	1	3	1	0	1	1	6	27
Delaware:											
Wilmington	1	------	0	0	2	1	0	1	0	2	23
Maryland:											
Baltimore	1	4	0	0	11	21	0	11	2	42	189
Cumberland	0	------	0	0	1	4	0	0	0	0	16
Frederick	0	------	0	0	0	1	0	0	0	0	7
District of Columbia:											
Washington	6	------	0	1	7	15	0	7	7	2	125
Virginia:											
Lynchburg	8	------	0	0	0	4	0	0	0	1	[illegible]
Richmond	3	------	1	0	2	2	0	3	1	0	55
Roanoke	3	------	0	0	3	4	0	1	0	0	[illegible]

[1] 2 nonresidents.

City reports for week ended Sept. 30, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
West Virginia:											
Charleston	4	------	0	0	1	7	0	1	3	4	13
Huntington	2	------	0	0	0	5	0	0	0	0	------
Wheeling	0	------	0	2	1	0	0	1	0	4	19
North Carolina:											
Raleigh	1	------	0	0	2	3	0	0	0	0	15
Wilmington	2	------	0	0	0	0	0	1	0	1	14
Winston-Salem	18	1	1	1	0	4	0	1	0	1	20
South Carolina:											
Charleston	0	6	0	0	0	0	0	1	1	0	27
Columbia	0	------	0	0	0	0	0	0	0	0	10
Greenville	0	------	0	0	2	2	0	0	0	1	27
Georgia:											
Atlanta	11	10	0	0	3	4	0	2	4	1	74
Brunswick	0	------	0	0	1	0	0	0	0	0	5
Savannah	0	------	0	0	0	0	0	2	0	0	30
Florida:											
Miami	0	------	0	0	0	0	0	1	0	2	24
Tampa	1	------	0	0	1	0	0	1	0	0	23
Kentucky:											
Ashland	1	------	0	0	0	2	0	0	0	0	0
Lexington	2	------	0	0	0	2	0	3	0	0	17
Louisville	5	------	0	1	8	9	0	2	6	1	64
Tennessee:											
Memphis	5	------	0	0	2	7	0	5	4	7	74
Nashville	0	------	0	0	3	8	0	4	1	0	37
Alabama:											
Birmingham	10	1	1	1	1	5	0	2	3	0	60
Mobile	1	------	0	0	0	1	0	0	0	0	21
Montgomery	2	------	0	0	0	4	0	0	0	0	0
Arkansas:											
Fort Smith	------	------	------	------	------	------	------	------	------	------	------
Little Rock	4	------	0	1	2	1	0	3	0	1	6
Louisiana:											
New Orleans	11	1	1	0	7	4	0	12	2	3	135
Shreveport	1	------	0	0	1	2	0	4	1	2	37
Oklahoma:											
Oklahoma City	2	4	0	0	2	1	0	0	1	0	30
Texas:											
Dallas	13	------	0	0	4	6	9	5	1	2	50
Fort Worth	2	------	1	0	1	3	0	0	5	0	24
Galveston	0	------	0	0	1	2	0	2	0	0	17
Houston	19	------	0	0	5	0	0	2	1	0	68
San Antonio	3	------	0	0	10	1	0	6	1	0	56
Montana:											
Billings	0	------	0	0	0	0	0	0	0	0	3
Great Falls	0	------	0	0	0	0	0	0	0	0	3
Helena	0	------	0	0	0	0	0	0	0	0	2
Missoula	0	------	0	0	0	0	0	0	3	0	5
Idaho:											
Boise	0	------	0	0	0	0	0	0	0	5	6
Colorado:											
Denver	0	19	0	3	7	9	0	2	3	17	69
Pueblo	0	------	0	1	0	0	0	0	0	1	2
New Mexico:											
Albuquerque	0	------	0	0	2	0	0	4	5	2	15
Utah:											
Salt Lake City	0	------	0	6	4	5	0	1	1	1	23
Nevada:											
Reno	0	------	0	0	0	0	0	0	0	0	6
Washington:											
Seattle	1	------	2	1	6	4	0	8	1	4	99
Spokane	0	------	0	0	1	0	0	0	0	0	16
Tacoma	1	------	0	0	1	1	0	0	0	2	27
Oregon:											
Portland	3	------	0	0	2	9	0	2	1	1	80
Salem	0	1	0	0	0	0	0	0	1	0	------
California:											
Los Angeles	12	24	2	5	11	29	11	20	1	47	273
Sacramento	2	------	0	0	3	0	0	2	0	3	21
San Francisco	1	2	0	2	2	5	0	9	0	2	131

City reports for week ended Sept. 30, 1933—Continued

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Maine:				Minnesota—Continued.			
Portland	0	0	2	St. Paul	0	0	2
Massachusetts:				Iowa:			
Boston	0	0	5	Des Moines	0	0	1
Springfield	0	0	1	Missouri:			
Rhode Island:				Kansas City	1	1	0
Pawtucket	0	0	1	South Dakota:			
Providence	0	0	1	Aberdeen	0	0	1
Connecticut:				Nebraska:			
Hartford	0	0	1	Omaha	0	0	1
New York:				Kansas:			
Buffalo	0	0	2	Topeka	1	0	0
New York	3	0	33	Maryland:			
Syracuse	0	0	2	Baltimore	0	0	1
New Jersey:				Cumberland	0	0	1
Newark	0	0	4	District of Columbia:			
Pennsylvania:				Washington	0	0	1
Pittsburgh	0	0	4	Virginia:			
Ohio:				Richmond	0	0	1
Cincinnati	0	0	1	Georgia:			
Cleveland	0	0	2	Atlanta	1	1	0
Indiana:				Kentucky:			
Indianapolis	3	0	0	Louisville	0	0	1
Illinois:				Louisiana:			
Chicago	1	1	12	New Orleans	1	1	0
Michigan:				Washington:			
Detroit	1	0	1	Seattle	0	0	1
Wisconsin:				Tacoma	0	0	2
Milwaukee	1	0	0	California:			
Minnesota:				Los Angeles	0	0	1
Duluth	0	0	3	Sacramento	0	0	[2] 1
Minneapolis	0	0	9				

[2] Imported.

Lethargic encephalitis.—Cases: Philadelphia, 1; Cleveland, 3; Chicago, 1; Grand Rapids, Mich., 3; Kansas City, Mo., 10; St. Joseph, Mo., 3; St. Louis, 60; Omaha, 4; Lexington, Ky., 1; Louisville, 3; Dallas, Tex., 1; Houston, Tex., 1.

Pellagra.—Cases: Philadelphia, 1; Raleigh, N.C., 1; Charleston, S.C., 2; Miami, 1; Memphis, 1; Mobile, 1.

Typhus fever.—Cases: Charleston, S.C., 2; Atlanta, 8; Savannah, 5; Tampa, 1; Montgomery, Ala., 3. Deaths: Winston-Salem, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended September 23, 1933.—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the 2 weeks ended September 23, 1933, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				1	1	1				3
Chicken pox				28	56	12	33	5	24	158
Diphtheria		3	8	32	14	16	4	3	1	81
Dysentery					12					12
Erysipelas				7	1	2		2	7	19
Influenza					15		6		13	34
Lethargic encephalitis							1	1		2
Measles		1		47	4	3		1	7	63
Mumps			2		45	2	2	3	17	71
Paratyphoid fever					6			2		8
Pneumonia		2			10		11		7	30
Poliomyelitis				13	2		5	4		24
Scarlet fever		17	2	75	59	33	17	7	24	234
Trachoma							9		3	12
Tuberculosis			17	158	98	10	24	4	36	347
Typhoid fever	3		6	92	50	6	4	4	5	170
Undulant fever					14			1		15
Whooping cough		10	2	126	178	116	46	18	14	510

CUBA

Provinces—Communicable diseases—5 weeks ended July 29, 1933.—During the 5 weeks ended July 29, 1933, cases of certain communicable diseases were reported in the provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Chicken pox						2	2
Diphtheria	1	2	3	7	13	4	30
Malaria	33	3	2	29	10	24	101
Measles	4	3	3	9	1	2	22
Scarlet fever	4			3			7
Tuberculosis	12	127	65	51	56	28	339
Typhoid fever	9	6	19	18	27	27	106

DENMARK

Communicable diseases—July 1933.—During the month of July 1933, cases of certain communicable diseases were reported in Denmark as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	5	Mumps	245
Chicken pox	7	Paratyphoid fever	15
Diphtheria and croup	108	Poliomyelitis	16
Dysentery (amebic)	110	Puerperal fever	9
Erysipelas	184	Scabies	412
German measles	29	Scarlet fever	164
Gonorrhea	875	Syphilis	61
Influenza	1, 594	Tetanus	2
Lethargic encephalitis	2	Typhoid fever	4
Malaria	5	Undulant fever (Bact. abort. Bang)	52
Measles	423	Whooping cough	826

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Sept. 29, 1933, pp. 1206–1217. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Oct. 27, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Philippine Islands.—During the week ended October 7, 1933, cholera was reported in parts of the Philippine Islands as follows: Bohol Province, Banacon, 1 case; Nasingan Island, 1 death; Cebu Province, Argao, 9 cases, 7 deaths; Cebu city, 6 cases, 2 deaths; Minglanilla, 4 cases, 2 deaths; Talisay, 1 case, 1 death; and Toledo, 2 cases, 2 deaths. During the period September 10 to 25, 1933, cholera was reported in Samar Province, Philippine Islands, as follows: Calbayog, 1 case; Gandara, 26 cases, 15 deaths; Santa Margarita, 5 cases, 5 deaths.

Plague

Ecuador—San Antonio.—During the month of September 1933, 3 cases of plague with 2 deaths were reported in San Antonio, Chimborazo Province, Ecuador.

Egypt—Gharbiya Province—Tanta.—During the week ended September 30, 1933, 3 cases of plague with 2 deaths were reported in Tanta, Gharbiya Province, Egypt.

Libya—Tripolitania—Gheran.—During the week ended September 30, 1933, 1 case of plague was reported in Gheran, near Zanzur, Tripolitania, Libya.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

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OCTOBER 27 - - - 1933

IN THIS ISSUE

A Summary of Current Prevalence of Communicable Diseases
Photoelectric Measurement of Mitogenetic Radiation
Deaths in Large Cities During the Week Ended October 7
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS are intended primarily for distribution to health officers, members of boards or departments of health, and those directly or indirectly engaged in or connected with public health or sanitary work. Articles of general or special interest are issued as reprints from the PUBLIC HEALTH REPORTS or as supplements, and in these forms are available for general distribution to those desiring them.

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PUBLIC HEALTH REPORTS

VOL. 48 OCTOBER 27, 1933 NO. 43

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES[1]

September 10–October 7, 1933

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease."

Poliomyelitis.—For the country as a whole, the number of cases of poliomyelitis dropped from 1,412 for the 4 weeks ended September 7 to 1,271 for the current 4-week period, but still remained considerably in excess of that for the corresponding period last year and more than twice the number reported for this period in 1929. For the corresponding 4 weeks in 1931 and 1930, both epidemic years, the numbers of cases were 4,122 and 2,236, respectively.

In the New England and Middle Atlantic States, where the disease has been most prevalent, the number of cases dropped from 954 for the preceding 4-week period to 682 for the current period. Massachusetts, New York, and Pennsylvania all reported appreciable decreases. In New Jersey the number of cases equaled that for the preceding 4 weeks. In Maine and Connecticut, however, an increase of 25 percent in the number of cases was reported. One other area, the East North Central, reported a 25 percent decrease. All other areas reported increases, and in some the incidence was slightly higher than might be expected at this time.

In the East North Central States the number of cases (223) was 2.4 times that for the corresponding period last year; in the West North Central group the number (175) was 3.2 times that of last year, while in the Mountain region the 17 cases reported for the current period was three times the number reported last year, and the 62 cases reported from the Pacific area was twice that of last year. Maryland

[1] From the Office of Statistical Investigations, U.S. Public Health Service. The numbers of States included for the various diseases are as follows: Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 47; diphtheria, 48; scarlet fever, 48; influenza, 38 States and New York City. The District of Columbia is counted as a State in these reports. These summaries include only the 8 important communicable diseases for which the Public Health Service receives regular weekly reports from the State health officers.

and West Virginia, with 14 and 22 cases, respectively, seem responsible for a 25 percent increase in the South Atlantic area. The South Central area reported only a normal seasonal incidence.

Meningococcus meningitis.—The number of cases of meningococcus meningitis (130) reported for the current 4-week period was approximately the same as that reported for the preceding 4 weeks. As compared with recent years the incidence for the country as a whole was the lowest for this period in the 5 years for which data are available. The disease was considerably less prevalent than in recent years in the New England, Middle Atlantic, North Central, Mountain, and Pacific areas, while in the South Atlantic States the number of cases (26) was the highest reported for this period in recent years. In the South Central areas the incidence closely approximated that of the preceding 4 years.

Smallpox.—For the first time during the current year the incidence of smallpox for a 4-week period reached the level of the corresponding period last year. The number of cases reported for the 4 weeks ended October 7 was 131, as compared with 130, 335, and 576 for the same period in 1932, 1931, and 1930, respectively. The appearance of the disease in several States in the West North Central area and a rather high incidence in Texas and California seemed mostly responsible for the upturn at this time. In the 3 preceding years the incidence during this period was the lowest recorded for the year, the rise not appearing until the next 4-week period.

Influenza.—The number of cases of influenza reported for the current period was 2,023, as compared with 2,593, 1,683, and 1,302 for the corresponding period in the years 1932, 1931, and 1930, respectively. Only the normal seasonal incidence was reported from the various geographic areas. The decrease from last year's figure was mostly due to the lower incidence during the current period in the South Atlantic, West South Central, and Mountain areas, where the disease was unusually prevalent at this time last year.

Typhoid fever.—The reported incidence of typhoid fever was the lowest for this period in recent years. For the 4 weeks ended October 7 the number of cases was 3,093, as against 3,553, 4,167, and 3,812 for the corresponding weeks in the years 1932, 1931, and 1930, respectively. This favorable situation existed in practically all sections of the country.

Diphtheria.—Reports indicated only a normal seasonal increase of diphtheria during the current 4-week period. Compared with recent years the rate of increase was very favorable, slightly below that of 1932 and 1931, but a little higher than in 1930. For the 4 weeks ended October 7 there were 4,830 cases reported, as compared with 5,695, 6,267, and 3,962 for the corresponding period in the years 1932, 1931, and 1930, respectively. Only one geographic area, the South

Atlantic, reported an increase over last year's figure for the same period.

Measles.—The number of cases of measles (2,026) reported for the current 4-week period closely approximated the average for the corresponding period in the 4 preceding years. All areas except the East North Central reported the lowest incidence for the current year during this 4-week period. In the East North Central area the lowest level for the year apparently was reached during the preceding 4-week period.

Scarlet fever.—There were reported 8,107 cases of scarlet fever, an increase of approximately 3,700 over the preceding 4-week period, to which all regions contributed. As compared with previous years, the incidence closely approximated that for the corresponding period last year (8,293 cases) but was considerably in excess of the incidence in the years 1931, 1930, and 1929, in which years the numbers of cases totaled 6,428, 5,220, and 6,198, respectively. The situation in practically all geographic areas was similar to that described for the whole reporting area.

Mortality, all causes.—Deaths from all causes in large cities, as reported by the Bureau of the Census, for the current 4-week period averaged 9.8 per thousand inhabitants (annual basis), as compared with 9.5, 10.2, and 10.4 for the corresponding periods in the years 1932, 1931, and 1930, respectively. During each of the four preceding 4-week periods the death rate was approximately equal to that of the corresponding periods in 1932. Aside from periods when influenza was epidemic, the death rate has rather steadily decreased since 1929. It is impossible to say at present whether the past few months mark a change in this trend or only a temporary slackening in the decrease. The rate is still well below rates for the corresponding periods in 1931 and 1930, both of which years had a low mortality.

INVESTIGATION OF MITOGENETIC RADIATION BY MEANS OF A PHOTOELECTRIC COUNTER TUBE

By Egon Lorenz, *Biophysicist, Office of Field Investigations of Cancer, United States Public Health Service*

Since A. Gurwitsch (1), in 1923, announced his theory of mitogenetic radiation, an ever increasing number of papers have been published yearly in various journals (2). Most of these papers deal with the biological side of this problem, presenting more or less successfully experimental proof of the existence of such radiation, while only a few report completely negative results (3). This problem has also been attacked from the physical side. Thus, two investigators, Rajewsky (4), and Frank and Rodionow (5), report positive findings

of this radiation by physical means, while others, Schreiber and Friedrich (6), and Locher (7), with a similar experimental arrangement, could not detect any trace of it at all.

The present paper deals with the physical side of the problem.

According to Gurwitsch's theory, the division of a cell is accompanied by the emission of radiation, which in turn will stimulate the division of other cells by which it is absorbed. When yeast is used as a biological test-object for the radiation, the increase in the number of budding cells in comparison with a control gives a measure of the effect. A rough estimate of the intensity of the radiation can be made as follows: The diameter of a yeast cell is approximately 6 microns. Thus, we have, the cells being packed closely together, approximately 30,000 cells per mm². The number of budding cells in normal yeast is, according to Gurwitsch, about 10 percent of the total number. Half an hour's experiment with a mitogenetic inductor may give an increase in the number of budding cells of 50 percent. This would mean for our example 1,500 budding cells. Assuming that each radiation quantum that falls upon the yeast is absorbed and furnishes the stimulus for the division of one cell, we have as intensity of the mitogenetic radiation in our example 1,500 quanta per mm² per 30 minutes, or approximately 80 quanta per cm² per second. But it is highly improbable that each quantum absorbed by any portion of a cell should give rise to a cell division. Assuming an "efficiency" of 1/10 for this process (and this fraction is probably still too high; e.g. the "efficiency" of the photoelectric process is about 1/1000), we obtain as a possible intensity of the mitogenetic radiation a value of at least 1,000 quanta per cm² per second. We have neglected here the possible influence of secondary mitogenetic radiation within the irradiated specimen; this must be small, according to the data available for yeast which has not been irradiated. According to an estimate by Frank and Rodionow, the intensity of the mitogenetic radiation lies between 100 and 1,000 quanta per cm² per second (8).

Two physical methods are available to measure such small intensities. First, the photographic plate, and second, the photoelectric cell. To get a just perceptible blackening of a sensitive photographic emulsion with a radiation intensity of about 100 quanta per cm² per second, a time of exposure of about 200 hours would be necessary. A photoelectric cell of medium sensitivity will have an efficiency of 1/1000 approximately for the wave-length of its maximum sensitivity, i.e. for 1,000 impinging light quanta 1 photoelectron will be liberated. With a photoelectric cell of the customary type connected into a circuit with a battery and an electrometer or galvanometer, such small currents cannot be measured. However, they can be measured by combining a photoelectric cell with a Geiger counter

tube. A Geiger counter tube consists of a fine wire axial in a metallic cylinder under a gas pressure of about 5 cm of mercury. By applying a negative potential of, say, 1,500 volts to the metallic cylinder and grounding the wire over a high resistance, an electron liberated from the walls of the tube by any kind of radiation will travel toward the wire, producing on its way ions by impact, which results in a relatively strong current impulse through the high resistance to ground. This current impulse can be recorded either by a string electrometer or by a suitable amplifier with recording device. To make such a counter tube sensitive to light, one has only to cover the walls of the tube with a photoelectric metal and to provide a window for the light. This method was first used in testing for mitogenetic radiation by Rajewsky (4); the other authors (5), (6), (7), previously mentioned used arrangements of a similar kind.

A counter tube with a window was also used in the experiments described here. In order to obtain highest sensitivity and constant working conditions over a long period of time, the counter tubes used consisted of a thin-walled quartz tube (wall thickness approximately 1 mm, length 10 cm, diameter 2 cm) of high transparency for ultraviolet light. The transparency of the tube was tested with a quartz spectrograph and it was found that absorption in the quartz was negligible down to 2,200 Å units, the limit of the spectrograph. An area of 6 to 7 cm^2 of the wall was flattened out to serve as window. The wire consisted of tantalum, 0.2 mm diameter, and was held by 2 thick copper wires which were held in place by 2 quartz capillaries on the ends of the tube. These copper leads were sealed vacuum-tight to the glass by silver chloride cement. The tube was exhausted by a mercury diffusion pump with liquid air trap and baked several times at approximately 1,200° C. Then spectroscopically pure cadmium was distilled in, the wire and window were heated to remove any cadmium deposit, and pure argon was filled in to a pressure of 4 to 5 cm of Hg. Counter tubes prepared this way do not show any change in sensitivity with time.

Cadmium, although not a very sensitive photoelectric metal, was nevertheless chosen, because its maximum sensitivity lies at shorter wave lengths than 2,300 Å units in a region to which, according to Gurwitsch (9), the mitogenetic spectrum belongs. A further advantage is that visible stray light of longer wave lengths will not affect the counter tube, since the threshold sensitivity of a cadmium counter tube was found to lie between 3,400 and 3,600 Å units. Counter tubes with zinc as photoelectric metal were also made. They were similar to the cadmium tubes, both in sensitivity and in threshold value.

The counter tubes were connected in a circuit with an amplifier operating a mechanical counter and a string electrometer in connec-

tion with a photographic recorder. In this way two sets of records could be obtained for every experiment. The accompanying diagram gives the experimental arrangement and data of the photoelectric hook-up.

As the counter tube described above is sensitive not only to ultraviolet radiation but also to radiation coming from radioactive substances in the ground, air, and walls of the building as well as to cosmic radiation, every counter tube will give a residual effect, i.e., the apparatus will record a certain number of counts per minute due to electrons liberated by these radiations, the number of which depends upon the cross-sectional area of the tube and its sensitivity. This "background" radiation has to be taken into account in every experiment with another source of radiation. It is desirable to cut it down as much as possible, especially if we wish to measure extremely small amounts of another radiation which will produce only a few additional counts in a given time. For this reason, the counter was enclosed in a lead box so that it was surrounded on all sides by 10 cm of lead. Although this cuts out only the softer components of the background radiation, nevertheless the shield effected a reduction of approximately 50 percent in the number of counts.

Experiments with a biological object as a possible source of radiation were carried out in the following way: First the effect of the background radiation was measured by counting the number of counts during a certain time, usually 30 minutes. Then the biological object was placed upon the window and the number of counts measured during the same time, and finally the test for the background radiation was repeated after removing the biological material. It seemed inadvisable to extend the time of the biological measurement much beyond 30 minutes, as it was difficult to keep the tissue active for a longer period of time under the prevailing conditions. However, numerous checks of the tissues used, both before and after the experiments, showed that the tissues remained alive and healthy during 30-minute exposures.

The number of counts produced by the counter tube was, on an average, approximately 20 per minute, i.e., in half an hour about 600 counts were recorded. As the liberation of an electron by radiation from the wall of the counter tube is governed by statistical laws, the observed number of counts of 600 as measured, or the radiation intensity, is subject to the statistical error given by $\sqrt{600}$, or ± 24.5 counts. If we add to the background radiation another radiation from a very weak source we can detect this radiation only if it records, together with the background radiation, a number of counts in the same time which is larger than the number produced by the background radiation alone plus its statistical error. We shall arbitrarily assume that a number of counts which exceeds by twice the statistical

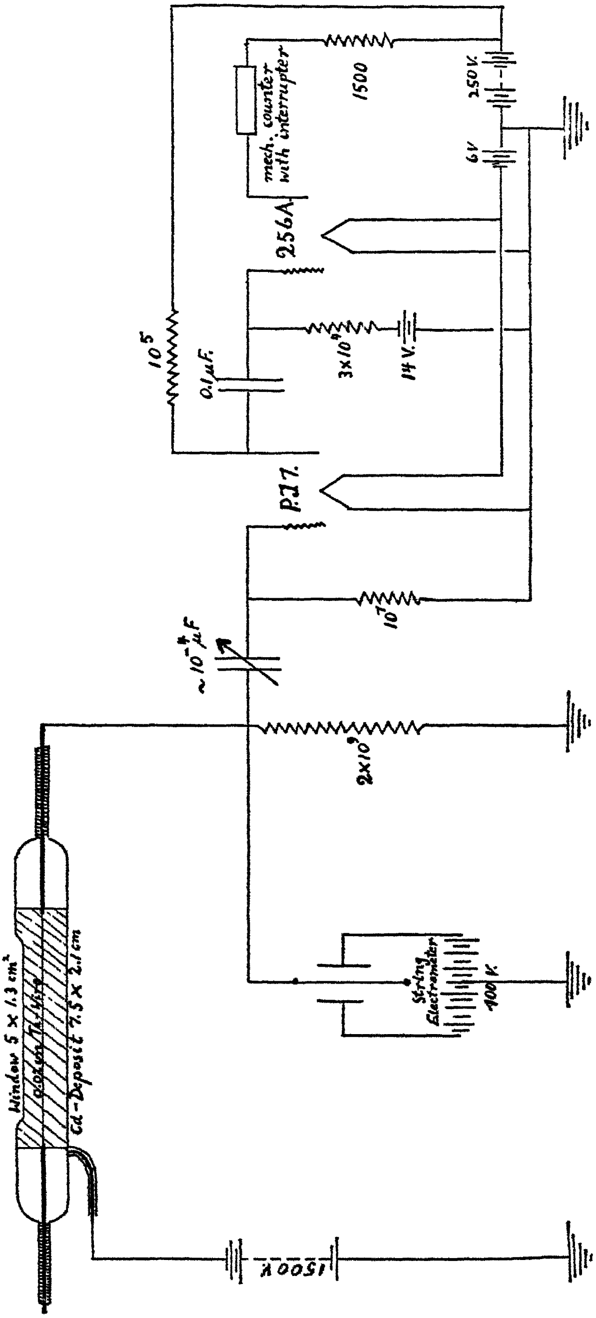

Diagram of the photoelectric hook-up.

error of the number of counts produced by the background radiation in the same time is an indication of the presence of another radiation and will call this the "minimum effect." Even then only a series of observations all of which show an effect of the same order of magnitude will give us definite proof of the existence of an additional radiation. These considerations show the importance of cutting down the background radiation and extending the time of an experiment, as both factors will increase the sensitivity of the arrangement.

From the minimum effect of 50 additional counts (twice the statistical error) in 30 minutes, it is possible to calculate the theoretical number of light quanta which one should be able to detect. Fifty counts in 30 minutes correspond to 0.03 counts per second. The photoelectric efficiency being of the order of magnitude of 1:1000, 0.03 counts per second will be produced by 30 quanta per second passing through the window. The area of the window being approximately 6 cm^2, we obtain a theoretical number of 5 light quanta per cm^2 per second which we should be able to detect. This is far below the theoretical minimum intensity of the mitogenetic radiation.

The experimental calibration of the counter tubes was carried out in the following way: By means of a Bausch and Lomb quartz monochromator, the intensity of the Hg line $\lambda = 2536$ Å units was measured with a Coblentz vacuum thermopile calibrated in absolute units against a standard lamp. Then the intensity of the line was decreased to $1:9 \times 10^9$ of its value by putting between the mercury burner and the front slit of the monochromator an absorption vessel containing a solution of $K_2Cr_2O_7$. The extinction coefficient of $K_2Cr_2O_7$ was carefully determined with the thermopile by using a series of more dilute solutions. In addition, checks of the validity of Beer's law were made, although it could be assumed that Beer's law was valid for the concentration of 8 grams in 10 liters of water used to produce the above intensity reduction of $1:9 \times 10^9$. It was found that the law was valid within the experimental error. By removing the thermopile and placing the counter tube behind the exit slit and cutting down the intensity of the beam with the $K_2Cr_2O_7$ filter, the number of counts in a given time produced by this radiation could be measured, and from these data the minimum effect could be determined as above. For the mercury line $\lambda = 2536$ Å units, 50 additional counts in 30 minutes were produced by an intensity of 10 to 15 quanta per cm^2 per second falling upon the window of the counter tube. Although it is difficult to make even an estimate of the probable error of this value, since the errors of so many single measurements contribute to the final error, it can be said at least that the order of magnitude is correct. As the line 2536 Å units lies on the ascending part of the curve for the photoelectric sensitivity of cadmium, the number of

quanta required to produce the minimum effect for the shorter wave lengths in the region of the mitogenetic radiation must be still smaller.

The biological material tested for mitogenetic radiation consisted mainly of onion-base pulp and tips of onion roots. Mouse sarcoma 180, mouse embryo tissue, and tetanized frog muscle, all alleged to be excellent radiators, were likewise tested. The results of some of the experiments are given in table 1.

TABLE 1.—*Results of some of the tests*

Biological material	Time in minutes	Number of counts						Effect
		Control		With biological object		Control		
			±		±		±	
Onion-base pulp	30	529	23.0	523	23.0	534	23.0	None.
Do	30	562	23.6	562	23.6	516	22.7	None.
Do	30	552	23.5	534	23	407	22.3	None.
Mouse-embryo	30	543	23.3	552	23.5	515	22.7	None.
Do	30	646	25.4	611	24.7	617	24.8	None.
Onion-base pulp	30	535	23.1	521	22.8	527	22.9	None.
Mouse-embryo	30	507	22.5	517	22.7	543	23.3	None.
Onion root	40	643	25.3	643	25.3	641	25.3	None.
Do	40	981	31.3	977	31.2	898	29.9	None.
Do	40	1,112	33.3	1,092	33.0	1,159	34.0	None.
Frog muscle (tetanized)	30	656	25.6	673	25.9	669	25.8	None.
Mouse sarcoma	40	504	22.4	521	22.8	624	24.9	None.
Do	40	597	24.4	582	24.1	625	25.0	None.

The data given in table 1 show that no mitogenetic radiation could be detected. When the experiments were started, positive effects were found at first. In all cases, however, it could be shown that these were due to a static effect of the biological material upon the field in the counter tube, e.g., it was possible to produce a positive effect with such inert substances as distilled water. Whenever tube and window were properly shielded against static influences, no positive effect could be observed.

Thus, in these experiments, no physical proof for the existence of the mitogenetic radiation could be found, although the experimental arrangement was of such sensitivity that it should have been possible to detect still weaker intensities. The discrepancy between these experiments and those of the investigators who confirmed the existence of mitogenetic radiation by means of a photoelectric counter tube may perhaps be explained by the static effects mentioned above.

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(9) Ibid., p. 34.

COURT DECISION RELATING TO PUBLIC HEALTH

Clerk of courts, who is local registrar of vital statistics, held entitled to fees under vital statistics act in addition to his regular salary.—(South Dakota Supreme Court; *Minnehaha County* v. *Foster*, 249 N.W. 688; decided July 18, 1933.) Prior to 1919, the vital statistics law expressly provided that the fees payable thereunder to the clerks of courts or local registrars should be retained by the clerks in addition to their regular salaries. In 1919 a statute was enacted which related to the salaries of county officers, including the clerk of courts, and which provided therein "That the salaries hereinbefore provided shall be full compensation for all services rendered by such county officials under any and all laws of this State, and that all fees and per diem collected under the laws of this State by any such county officials shall be paid by such county officials to the county treasurer of their respective counties." Following the passage of this law, the supreme court in 1920 rendered a decision that the clerks of courts were not entitled to retain the vital statistics fees. This decision was followed by a 1920 law which gave the clerks of courts the right to retain the said fees as their own. In 1931 the legislature enacted a comprehensive vital statistics law which expressly repealed the 1920 law above mentioned and which did not contain any express provision to the effect that the clerks of courts should be entitled to receive the vital statistics fees in addition to their salaries. Among the provisions of the 1931 law were the following:

> [Sec. 4.] The clerk of courts shall be entitled to a fee of 10 cents for each abstract of marriage, divorce, and naturalization record transmitted by him. Such fees to be paid out of the general fund of the county as herein provided.
>
> [Sec. 19.] Each local registrar [who is the clerk of courts] shall be paid the sum of 25 cents for each birth certificate and each death certificate properly and completely made out and registered with him and correctly recorded and promptly returned by him to the State director of vital statistics as required by this act. * * * All amounts payable to a local registrar under the provisions of this section shall be paid by the treasurer of the county in which the registration district is located, upon certification by the State director of vital statistics.

In an action wherein a county sought to recover from the defendant clerk of courts and local registrar of vital statistics the fees collected under the 1931 law, the Supreme Court stated that it was of the opinion that, by inserting the above-quoted provisions in the 1931

law, the legislature clearly evidenced an intention that the clerk should be paid the fees in addition to his regular salary. The court closed its opinion with the following:

The situation which confronted the court in the Risty case was, therefore, that the legislature had enacted the said chapter 148, laws 1919, at a time when the clerks of courts were being paid these fees in addition to their regular salaries. The situation which now confronts the court is that the legislature, at a time 12 years after the enactment of chapter 148, laws 1919, has enacted a law which provides that the county treasurer (the same official to whom the 1919 law says the fees collected by a county officer shall be paid) shall pay to the clerk of courts the fees provided under the provisions of the 1931 law. It does not seem reasonable to conclude that the legislature intended to provide by the 1931 law that the county treasurer should pay these fees to the clerk of courts in order that the clerk of courts might, under the provisions of the 1919 law, repay these fees to the county treasurer. We, therefore, conclude that, when the legislature again provided in 1931 that these fees should be paid to the clerk of courts by the county treasurer, it was the intent of the legislature that these fees should be retained by the clerk.

DEATHS DURING WEEK ENDED OCT. 7, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Oct. 7, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	6,978	6,847
Deaths per 1,000 population, annual basis	9.8	9.8
Deaths under 1 year of age	558	575
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	49	48
Deaths per 1,000 population, annual basis, first 40 weeks of year	10.9	11.1
Data from industrial insurance companies:		
Policies in force	67,628,120	70,292,218
Number of death claims	11,218	11,013
Death claims per 1,000 policies in force, annual rate	8.6	8.2
Death claims per 1,000 policies, first 40 weeks of year, annual rate	9.8	9.6

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended October 14, 1933, and October 15, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Oct. 14, 1933, and Oct. 15, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Oct. 14, 1933	Week ended Oct. 15, 1932	Week ended Oct. 14, 1933	Week ended Oct. 15, 1932	Week ended Oct. 14, 1933	Week ended Oct. 15, 1932	Week ended Oct. 14, 1933	Week ended Oct. 15, 1932
New England States:								
Maine	2	3			2		0	0
New Hampshire	1					3	0	0
Vermont		2				1	0	0
Massachusetts	21	19		1	67	32	0	1
Rhode Island		3			1		0	0
Connecticut	3	2	2	2	4	4	0	0
Middle Atlantic States:								
New York	55	31	[1] 13	[1] 12	43	85	1	2
New Jersey	15	22	7	12	15	69	1	2
Pennsylvania	43	85			35	97	2	4
East North Central States:								
Ohio	78	101	80	66	12	31	1	1
Indiana	73	78	45	10	4	2	2	2
Illinois	44	113	4	9	13	15	3	3
Michigan	33	21	4	23	11	48	0	0
Wisconsin	2	15	29	19	25	54	0	0
West North Central States:								
Minnesota	19	16	1		1	60	0	1
Iowa [2]	11	25			4	1	0	1
Missouri	111	91	2	5	4	5	1	1
North Dakota	13				4	16	0	0
South Dakota	2	3	2		4		0	0
Nebraska	3	30		6	3	2	0	1
Kansas	20	46		4	3	5	0	3
South Atlantic States:								
Delaware		4			1	2	0	1
Maryland [2, 3]	27	27	6	3	2	2	2	0
District of Columbia	7	6		1	1		0	0
Virginia [4]	122	75			15	11	1	0
West Virginia	115	42	18	16	1	4	1	0
North Carolina [4]	171	94	10	9	19	11	0	1
South Carolina [4]	43	33	244	317	51	17	0	0
Georgia [4]	66	70		52	49	24	0	1
Florida	9	28		1	1	1	0	0
East South Central States:								
Kentucky	131	88				48	1	0
Tennessee	118	110	30	41	36		1	1
Alabama [4]	61	89	13	4	6		1	1
Mississippi	55	49					3	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Oct. 14, 1933, and Oct. 15, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Oct. 14, 1933	Week ended Oct. 15, 1932	Week ended Oct. 14, 1933	Week ended Oct. 15, 1932	Week ended Oct. 14, 1933	Week ended Oct. 15, 1932	Week ended Oct. 14, 1933	Week ended Oct. 15, 1932
West South Central States:								
Arkansas	20	46	2	32	7	1	0	0
Louisiana	30	43	2	11	-------	4	1	0
Oklahoma [5]	63	120	22	27	10	1	0	3
Texas [4]	202	147	158	36	4	3	3	0
Mountain States:								
Montana	1	-------	-------	1	1	64	0	1
Idaho	1	8	1	-------	-------	-------	0	0
Wyoming	1	-------	-------	1	-------	1	0	0
Colorado	3	9	-------	-------	-------	7	0	0
New Mexico	4	3	-------	6	11	1	0	0
Arizona	3	3	6	-------	6	-------	0	0
Utah [2]	-------	4	2	1	13	2	0	1
Pacific States:								
Washington	7	9	-------	57	18	3	1	0
Oregon	-------	1	16	37	8	12	0	0
California	33	49	34	123	108	12	2	3
Total	1,842	1,869	753	945	623	761	28	35

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Oct. 14, 1933	Week ended Oct. 15, 1932	Week ended Oct. 14, 1933	Week ended Oct. 15, 1932	Week ended Oct. 14, 1933	Week ended Oct. 15, 1932	Week ended Oct. 14, 1933	Week ended Oct. 15, 1932
New England States:								
Maine	3	5	5	11	0	0	4	3
New Hampshire	1	0	6	20	0	0	0	1
Vermont	7	1	17	6	0	0	0	0
Massachusetts	8	0	113	132	0	0	3	3
Rhode Island	0	0	11	9	0	0	1	1
Connecticut	2	1	39	27	0	0	2	2
Middle Atlantic States:								
New York	40	13	164	196	0	0	19	40
New Jersey	18	12	74	62	0	0	7	10
Pennsylvania	18	48	252	209	0	0	51	34
East North Central States:								
Ohio	26	2	425	329	0	8	48	36
Indiana	2	1	125	72	0	1	13	20
Illinois	12	5	189	215	0	1	23	42
Michigan	8	4	148	189	0	0	13	19
Wisconsin	2	1	39	41	4	0	1	4
West North Central States:								
Minnesota	19	4	59	37	3	0	3	5
Iowa [2]	3	5	42	42	1	1	3	12
Missouri	0	0	95	108	0	0	3	13
North Dakota	8	0	17	4	0	1	2	3
South Dakota	2	0	16	8	0	0	2	2
Nebraska	0	3	15	40	0	2	0	0
Kansas	2	0	108	72	0	1	10	3
South Atlantic States:								
Delaware	0	1	8	3	0	0	3	3
Maryland [2 3]	1	2	49	63	0	0	19	27
District of Columbia	0	2	14	13	0	0	4	0
Virginia [4]	3	3	114	69	0	0	29	33
West Virginia	1	0	79	53	0	0	30	35
North Carolina [4]	1	1	126	103	0	0	11	8
South Carolina [4]	0	1	9	13	0	0	19	21
Georgia [4]	0	0	21	15	0	0	15	24
Florida	0	0	0	10	0	0	5	6
East South Central States:								
Kentucky	1	2	165	82	0	1	26	38
Tennessee	3	1	125	69	0	0	27	20
Alabama [4]	0	2	49	59	0	0	11	21
Mississippi	0	2	40	41	0	0	11	10

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Oct. 14, 1933, and Oct. 15, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Oct. 14, 1933	Week ended Oct. 15, 1932	Week ended Oct. 14, 1933	Week ended Oct. 15, 1932	Week ended Oct. 14, 1933	Week ended Oct. 15, 1932	Week ended Oct. 14, 1933	Week ended Oct. 15, 1932
West South Central States:								
Arkansas	0	0	7	30	0	0	6	17
Louisiana	0	0	14	12	0	0	13	24
Oklahoma [5]	1	0	35	44	0	1	33	29
Texas [4]	0	8	29	49	4	4	8	16
Mountain States:								
Montana	0	0	10	7	0	4	1	7
Idaho	0	0	0	6	1	0	0	5
Wyoming	1	0	3	8	0	0	0	1
Colorado	2	0	22	21	0	0	10	5
New Mexico	0	0	17	15	0	0	12	10
Arizona	0	2	6	12	0	0	3	0
Utah [2]	0	0	7	6	0	0	2	0
Pacific States:								
Washington	4	14	25	24	2	1	2	4
Oregon	0	1	26	24	1	1	2	2
California	4	3	154	90	5	2	11	6
	203	150	3,113	2,764	21	29	521	625

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Rocky Mountain spotted fever, week ended Oct. 14, 1933: Maryland, 1 case.
[4] Typhus fever, week ended Oct. 14, 1933, 47 cases, as follows: Virginia, 1; North Carolina, 1; South Carolina, 1; Georgia, 17; Alabama, 24; Texas, 3.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
August 1933										
Colorado	1	13			15		1	32	3	37
September 1933										
Colorado	2	12			27		1	39	4	63
Florida		30	2	234	4	7	1	8	0	7
Georgia	4	216	104	1,108	89	17	2	65	1	146
Indiana	7	123	142	5	7		10	285	1	76
Iowa		51			5		13	125	0	34
Maine		1	9		7		24	22	0	20
Michigan	5	58	10	16	65		24	372	1	92
Nebraska	2	16			7		7	56	0	9
New Hampshire							7	29	0	1
New York	7	141		16	214		469	451	0	177
North Carolina	4	383	116		109	38	8	298	0	76
Ohio	3	155	122	17	40		128	729	0	228
Tennessee	2	285	64	1,297	36	21	25	265	1	252
West Virginia	6	274	72		70	1	28	355	2	253
Wyoming			3		12		4	13	0	3

August 1933

	Cases
Colorado:	
Chicken pox	17
Impetigo contagiosa	1
Mumps	10
Paratyphoid fever	2
Undulant fever	1
Vincent's angina	2
Whooping cough	59

September 1933

	Cases
Chicken pox:	
Colorado	26
Florida	1
Georgia	5
Indiana	50
Iowa	13
Maine	39
Michigan	106
Nebraska	18
New York	176
North Carolina	20
Ohio	140
Tennessee	17
West Virginia	19
Wyoming	1
Conjunctivitis:	
Georgia	4
Diarrhea and enteritis:	
Ohio (under 2 years)	56
Dysentery:	
Florida	8
Georgia (amebic)	7
Georgia (bacillary)	10
Michigan	2
New York	83
Ohio	4
Tennessee	37
West Virginia	20
Food poisoning:	
Ohio	6
German measles:	
Iowa	3
Maine	11
New York	34
North Carolina	6
Ohio	7
Tennessee	4
Hookworm disease:	
Georgia	163
Impetigo contagiosa:	
Colorado	32
Iowa	9
Tennessee	38
Lead poisoning:	
Ohio	15
Lethargic encephalitis:	
Colorado	5
Georgia	8
Indiana	4

September 1933—Continued

	Cases
Lethargic encephalitis—Continued.	
Iowa	21
Maine	2
Michigan	64
Nebraska	25
New York	24
Ohio	35
Tennessee	5
West Virginia	2
Mumps:	
Colorado	23
Florida	3
Georgia	13
Indiana	7
Iowa	8
Maine	20
Michigan	43
Nebraska	10
Ohio	27
Tennessee	22
West Virginia	2
Wyoming	3
Ophthalmia neonatorum:	
New York	4
North Carolina	1
Ohio	62
Tennessee	5
Paratyphoid fever:	
Colorado	1
Georgia	2
Indiana	3
Michigan	5
New York	13
North Carolina	2
Ohio	5
Tennessee	6
Puerperal septicemia:	
Colorado	1
Ohio	5
Tennessee	2
Rabies in animals:	
Indiana	31
Maine	6
Rocky Mountain spotted fever:	
Georgia	2
Iowa	1
North Carolina	5
Wyoming	1
Scabies:	
Tennessee	8
Screw worm infection:	
Georgia	1
Septic sore throat:	
Georgia	27
Michigan	15
New York	40
North Carolina	18
Ohio	103

September 1933—Continued

	Cases
Septic sore throat—Contd.	
Tennessee	22
Wyoming	5
Tetanus:	
Maine	1
Michigan	3
New York	8
Ohio	9
Tennessee	4
Trachoma:	
Georgia	4
Michigan	1
North Carolina	2
Ohio	3
Tennessee	30
Trichinosis.	
New York	17
Tularaemia:	
Georgia	2
Ohio	1
Tennessee	2
Wyoming	2
Typhus fever:	
Florida	11
Georgia	96
North Carolina	3
Ohio	1
Undulant fever:	
Georgia	18
Iowa	10
Michigan	12
Nebraska	1
New York	31
North Carolina	1
Ohio	14
Tennessee	4
Vincent's angina:	
Colorado	3
Iowa	2
Maine	11
Michigan	20
New York	50
Tennessee	7
Wyoming	1
Whooping cough:	
Colorado	95
Florida	14
Georgia	95
Indiana	84
Iowa	76
Maine	137
Michigan	716
Nebraska	167
New York	1,323
North Carolina	345
Ohio	500
Tennessee	167
West Virginia	194
Wyoming	8

WEEKLY REPORTS FROM CITIES

City reports for week ended Oct. 7, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0		0	0	1	1	0	0	0	3	18
New Hampshire:											
Concord	0		0	0	0	2	0	0	0	0	7
Manchester	0		0	0	1	0	0	0	0	0	15
Nashua	1		0	0	0	12	0	0	0	0	
Vermont:											
Barre	0		0	0	0	0	0	0	0	0	2
Burlington	0		0	0	0	3	0	0	0	0	9
Massachusetts:											
Boston	7		0	5	3	27	0	6	1	24	161
Fall River	3		0	0	0	2	0	3	0	5	27
Springfield	0		0	0	0	1	0	1	0	1	29
Worcester	0		0	15	0	6	0	1	0	13	38

City reports for week ended Oct. 7, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Rhode Island:											
Pawtucket	0	------	0	0	1	0	0	0	0	0	11
Providence	2	------	0	1	2	6	0	4	1	38	54
Connecticut:											
Bridgeport	0	------	0	1	3	2	0	2	0	0	35
Hartford	0	------	0	0	1	3	0	0	1	0	32
New Haven	0	------	0	0	0	1	0	1	1	1	26
New York:											
Buffalo	3	------	0	0	11	11	0	5	0	15	------
New York	21	10	5	13	91	40	0	84	23	115	1,278
Rochester	0	------	0	0	4	1	0	0	2	9	36
Syracuse	0	------	0	0	0	1	0	0	0	10	44
New Jersey:											
Camden	0	------	0	0	4	2	0	2	1	0	30
Newark	1	3	0	3	5	1	0	3	1	34	87
Trenton	0	------	0	1	0	0	0	2	0	3	31
Pennsylvania:											
Philadelphia	3	3	2	2	22	31	0	23	3	16	393
Pittsburgh	2	------	3	1	9	15	0	5	1	17	124
Reading	1	------	0	1	0	0	0	1	0	10	26
Ohio:											
Cincinnati	5	1	1	2	3	0	0	5	0	12	125
Cleveland	4	35	0	0	4	32	0	10	2	34	147
Columbus	3	------	0	0	7	18	0	5	0	0	92
Toledo	1	------	0	0	4	12	0	1	1	0	61
Indiana:											
Fort Wayne	9	------	0	0	2	1	0	0	2	0	20
Indianapolis	2	------	0	0	10	7	0	3	1	2	------
South Bend	0	------	1	0	0	12	0	1	0	1	14
Terre Haute	0	------	0	1	1	1	0	1	0	0	27
Illinois:											
Chicago	1	3	2	0	19	58	0	36	5	76	632
Springfield	0	------	0	0	1	2	0	0	0	0	19
Michigan:											
Detroit	18	4	1	6	10	39	0	16	1	57	210
Flint	4	------	0	1	1	18	0	2	0	1	25
Grand Rapids	1	------	0	0	1	4	0	1	1	3	27
Wisconsin:											
Kenosha	0	------	0	0	0	1	0	0	0	2	10
Madison	0	------	0	0	0	0	0	0	0	9	13
Milwaukee	1	1	1	3	1	5	0	0	0	53	90
Racine	0	------	0	0	0	1	0	0	0	3	18
Superior	0	------	0	0	0	0	0	0	0	1	11
Minnesota:											
Duluth	0	------	0	0	1	2	0	1	0	0	18
Minneapolis	2	1	0	1	1	16	0	2	0	19	75
St. Paul	0	------	0	0	2	5	0	3	2	4	50
Iowa:											
Des Moines	2	------	0	0	0	15	1	0	0	0	29
Sioux City	1	------	0	1	0	2	0	0	0	0	------
Waterloo	1	------	------	0	------	0	0	------	0	0	------
Missouri:											
Kansas City	2	------	0	0	5	13	0	6	0	0	79
St. Joseph	1	------	0	0	3	2	0	0	0	0	22
St. Louis	18	2	1	0	2	6	0	7	5	14	186
North Dakota:											
Fargo	0	------	0	0	1	0	0	0	0	0	5
Grand Forks	0	------	0	0	0	0	0	0	0	1	------
South Dakota:											
Aberdeen	0	------	0	0	0	0	0	0	0	0	------
Nebraska:											
Omaha	4	------	0	1	8	2	0	0	0	3	44
Kansas:											
Topeka	0	------	0	1	0	2	0	0	0	5	6
Wichita	2	------	0	1	1	4	0	0	0	11	15
Delaware:											
Wilmington	0	------	0	0	5	0	0	0	0	1	22
Maryland:											
Baltimore	1	5	0	1	12	7	0	6	4	43	169
Cumberland	3	------	0	0	0	3	0	0	0	0	14
Frederick	0	------	0	0	0	2	0	0	0	0	4
Dist. of Columbia:											
Washington	5	------	0	1	10	5	0	9	2	5	134
Virginia:											
Lynchburg	5	------	0	1	0	6	0	1	0	1	9
Richmond	8	------	0	0	0	7	0	3	1	0	48
Roanoke	3	------	0	0	0	8	0	1	2	4	11

City reports for week ended Oct. 7, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
West Virginia:											
Charleston	------	------	------	------	------	------	------	------	------	------	------
Huntington	5	------	0	0	0	0	0	0	0	0	------
Wheeling	0	------	0	0	1	2	0	0	2	1	16
North Carolina:											
Raleigh	0	------	0	0	1	3	0	0	0	1	7
Wilmington	0	------	0	0	0	0	0	1	1	0	11
Winston-Salem	12	------	0	0	1	3	0	0	1	0	16
South Carolina:											
Charleston	1	14	1	0	2	0	0	0	0	0	31
Columbia	0	------	0	0	0	0	0	0	0	0	4
Greenville	0	------	0	0	1	2	0	0	0	2	8
Georgia:											
Atlanta	9	1	0	0	0	2	0	4	0	4	48
Brunswick	0	------	0	0	0	0	0	0	0	0	3
Savannah	1	13	1	0	0	1	0	4	0	5	29
Florida:											
Miami	1	------	0	0	1	0	0	1	0	0	21
Tampa	1	------	0	0	0	0	0	3	0	0	29
Kentucky:											
Ashland	1	------	0	0	0	3	0	0	3	4	------
Lexington	4	------	0	0	2	2	0	2	1	0	15
Louisville	10	2	0	0	3	9	0	0	3	0	67
Tennessee:											
Memphis	7	------	0	0	1	4	0	3	3	2	61
Nashville	5	------	0	0	1	8	0	2	4	2	31
Alabama:											
Birmingham	9	------	1	0	5	8	0	3	1	0	76
Mobile	2	------	0	0	1	0	0	1	0	0	17
Montgomery	3	------	------	0	------	2	0	------	1	2	------
Arkansas:											
Fort Smith	2	------	------	0	------	0	0	------	0	0	------
Little Rock	1	------	0	1	2	0	0	0	0	0	3
Louisiana:											
New Orleans	11	2	1	0	11	3	0	11	0	0	124
Shreveport	6	------	0	0	2	2	0	3	1	0	46
Texas:											
Dallas	14	------	0	0	1	5	0	3	2	------	37
Fort Worth	2	------	0	0	2	1	0	2	3	0	23
Galveston	0	------	0	0	0	0	0	0	1	0	13
Houston	12	------	0	0	3	1	0	2	0	0	65
San Antonio	1	------	2	0	4	1	0	6	4	0	49
Montana:				0	0	1	0	0	0	0	17
Billings	0	------	0	0	0	0	0	0	0	2	10
Great Falls	0	------	0	0	0	0	0	0	0	0	3
Helena	0	------	0	0	0	0	0	0	0	0	2
Missoula	0	------	0								
Idaho:											
Boise	0	------	0	0	0	1	0	0	0	0	6
Colorado:											
Denver	2	19	0	1	2	5	0	5	0	15	67
Pueblo	0	------	0	0	0	0	0	0	1	2	5
New Mexico:											
Albuquerque	0	------	0	1	0	1	0	4	4	0	17
Utah:											
Salt Lake City	1	------	0	3	1	2	0	0	2	0	26
Nevada:											
Reno	0	------	0	0	1	0	0	0	0	0	6
Washington:											
Seattle	0	------	------	0	------	4	0	------	1	6	------
Spokane	0	------	0	4	3	1	0	0	0	0	28
Tacoma	0	------	0	0	0	5	0	0	0	0	18
Oregon:											
Portland	0	------	0	0	3	13	3	4	0	1	71
Salem	0	1	0	0	0	0	0	0	0	0	------
California:											
Los Angeles	7	20	0	2	11	31	2	14	2	40	296
Sacramento	0	------	0	0	0	2	0	1	0	1	19
San Francisco	0	2	3	2	7	10	0	11	2	19	138

City reports for week ended Oct. 7, 1933—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Maine:				Minnesota:			
Portland	0	0	1	Duluth	0	0	2
Vermont:				Minneapolis	0	0	7
Burlington	0	0	1	St. Paul	0	0	8
Massachusetts:				Missouri:			
Boston	0	0	4	St. Joseph	0	0	1
Worcester	0	0	3	St. Louis	0	0	2
Rhode Island:				North Dakota:			
Providence	0	0	2	Fargo	0	0	2
Connecticut:				Maryland:			
New Haven	0	0	1	Baltimore	0	0	1
New York:				District of Columbia:			
Buffalo	0	0	2	Washington	0	0	2
New York	1	0	16	Tennessee:			
Rochester	1	0	2	Memphis	1	1	0
Syracuse	0	0	5	Colorado:			
New Jersey:				Denver	1	1	0
Newark	0	0	1	Washington:			
Ohio:				Seattle	0	0	1
Cleveland	0	0	2	Tacoma	0	0	1
Indiana:				Oregon:			
Fort Wayne	0	0	1	Portland	0	0	3
Indianapolis	2	0	0	California:			
Illinois:				Los Angeles	0	0	2
Chicago	2	2	6				
Michigan:							
Detroit	0	0	2				

Lethargic encephalitis.—Cases: Worcester, Mass., 1; New Haven, 1; New York, 1; Trenton, 1; Cleveland, 1; Chicago, 4; Detroit, 1; Minneapolis, 1; Sioux City, Iowa, 1; Kansas City, Mo., 7; St. Joseph, Mo., 5; St. Louis, 41; Omaha, 2; Topeka, 2; Atlanta, 1; Louisville, 17; Houston, Tex., 1.

Pellagra.—Cases: Philadelphia, 1; Charleston, S.C., 1; Savannah, 1; Memphis, 1; Birmingham, 1; Mobile, 1.

Typhus fever.—Cases: Charleston, S.C., 2; Atlanta, 1; Savannah, 8; Mobile, 1; Dallas, Tex., 1; Galveston, 1.

Rabies in man.—Deaths: Houston, Tex., 1.

FOREIGN AND INSULAR

CANADA

Quebec Province—Communicable diseases—Two weeks ended October 7, 1933.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended October 7, 1933, as follows:

Disease	Cases	Disease	Cases
Chicken pox	48	Poliomyelitis	10
Diphtheria	29	Scarlet fever	107
Erysipelas	4	Tuberculosis	94
German measles	2	Typhoid fever	115
Influenza	1	Undulant fever	1
Measles	66	Whooping cough	106
Ophthalmia neonatorum	1		

CUBA

Habana—Communicable diseases—Four weeks ended October 7, 1933.—During the 4 weeks ended October 7, 1933, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths
Diphtheria	2	
Malaria	12	1
Tuberculosis	11	4
Typhoid fever	13	8

Provinces—Communicable diseases—Five weeks ended September 2, 1933.—During the 5 weeks ended September 2, 1933, cases of certain communicable diseases were reported in the Provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cerebrospinal meningitis				1			1
Chicken pox			1	5	4		10
Diphtheria	1	2		3		3	9
Malaria	31	3	34	43	8	28	147
Measles		1		6	2	1	10
Scarlet fever			1	4			5
Tuberculosis	18	73	35	55	38	58	277
Typhoid fever	10	16	23	35	61	22	167

JUGOSLAVIA

Communicable diseases—August 1933.—During the month of August 1933, certain communicable diseases were reported in Jugoslavia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	131	10	Poliomyelitis	3	1
Cerebrospinal meningitis	6	3	Scarlet fever	240	14
Diphtheria and croup	490	56	Sepsis	12	6
Dysentery	390	32	Tetanus	55	28
Erysipelas	158	11	Typhoid fever	405	38
Measles	88	5	Typhus fever	83	2
Paratyphoid fever	19	2			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Apr. 30–May 27, 1933	May 28–June 24, 1933	Week ended— July 1933: 1	8	15	22	29	August 1933: 5	12	19	26	September 1933: 2	9	16	23	30
China:																			
Canton	C							1											
Hankow	C			2	1					2						1			
	D			1						1	1								
Swatow	C			2															
Tientsin	C					2	2												
India	C	7,878	11,095	8,201	3,517	900	1,254	1,632	1,293	1,902	1,510	1,785	2,376						
	D	3,852	5,655	4,091	1,555	441	557	715	539	805	584	736	1,012						
Bombay	C		1	2	1	1	1	2	1	1				1				1	
Calcutta	C	327	770	690	196	14	24	14	7	18	16	12	18	13	21	28	23	12	
Chittagong	C	5	16	21	7								1						
Colong	C		1																
Moulmein	C				3														
Rangoon	C		1	1	1			2											
Vizagapatam	C			1						4									
Indo-China (see also table below):																			
Pnom-Penh	C	1		2	1														
Saigon and Cholon	C	1	4			3	3	1	1		2								
Philippine Islands: [1]																			
Bohol Province	C			15	80						1								6
	D			12	38														3
Cebu Province	C	2			2	2	6	33	41	8	4	14	6	2	1	9	6	11	12
	D	2			2	2	2	9	20	6	5	8	7		1	7	4	9	7
Cebu	C				1								1		1		1	2	5
	D				1								1		1		1	2	3
Iloilo Province-Iloilo	C			1				1											
	D			1				1											
Leyte Province	C	26	50	22	2								2			1			
	D	21	46	20	2								2			1			
Occidental Negros Province	C				19	5	1						1					1	
	D				9	6	1						1					1	

Pampanga Province	C			1															
	D			1															
Rizal Province	C			1															
Samar Province [1]	C	[3] 186	67	29	7								16	15					
	D	[3] 144	50	23	5								11	9					
Siam:																			
Bangkok	C			1	1														
Provinces	C		1	13	28		1												
	D			6	14		1												
On vessels:																			
S.S. Dunana at Madras	D			1															
S.S. Lauterfels at Calcutta	C			1															
S.S. Mathura at Calcutta	C			1															

[1] For the week ended Oct. 14, 1933, cholera was reported in the Philippine Islands as follows: Bohol Province, Inbaga, 28 cases, 12 deaths; Cebu Province, Argao, 3 cases, 3 deaths; Cebu city, 6 cases, 3 deaths; Dimanjug, 2 cases, 1 death, Opon, 2 cases, 2 deaths; Toledo, 3 cases.

[2] For the period Sept. 10-25, 1933, 32 cases of cholera with 20 deaths were reported in Samar Province, Philippine Islands.

[3] Month of March 1933.

Place		March 1933			April 1933			May 1933			June 1933			July 1933			August 1933		
		1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31
Indo-China (French) (see also table above):																			
Cambodia [4]	C		2	2	5		4	11	14	17	23	31	14	3	1			1	
	D		1	2	5		2	8	10	9	12	17	6	3	1			1	
Cochin-China [4]	C	8	4	2	2	7	1	5	9	6	4	8	5	6	2	12	3	2	1
	D	7	3	2	2	7	1	4	8	6	4	8	4	5	2	3	3	2	1

[4] Reports incomplete.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE[1]

[C indicates cases; D, deaths; P, present]

Place		Mar. 5-Apr. 1, 1933	Apr. 2-29, 1933	Apr. 30-May 27, 1933	May 28-June 24, 1933	Week ended— July 1933 1	8	15	22	29	August 1933 5	12	19	26	September 1933 2	9	16	23
Argentina:[2]																		
Cordoba Province	C	5	1	8														
Rosario	C	2																
San Luis Province	C		7															
Azores:																		
Fayal	C																	1
St. Michaels	C																	7
	D																	1
Belgian Congo	C		P															
Bolivia: Tomina Province	C		P															
British East Africa (see also table below):																		
Kenya	C				3	2	2	2	1		2		1	10	2			
Tanganyika	D	1		1														
Uganda	C	44	48	85	53	14	9	12	15	8	21	20	19					
	D	44	48	83	53	14	9	12	15	8	21	20	10					
Ceylon:																		
Colombo	C	2	1		1	1	1									1		
	D	2			1	1	1									1		
Plague-infected rats						2	1	1			1							
Provinces	C	28																
	D	26																
China: Manchuria.[3]																		
Dutch East Indies:																		
Batavia	C	1																
West Java	C	966	949	878	793	224	284	320	326	280								
	D	953	918	872	789	220	284	320	326	278								
Ecuador. (See table below.)																		
Egypt:																		
Alexandria	C	1	1						2	2	1							
Asyut	C	8	11	10	2													
Aswan	C		3	1														
Faiyum	C				2	3			1							1	1	
	D								1									
Girga	C					1	1											
Minufiya	C	2	1	1														

Minya	C				4		1											
Qena	C												1					
	D												1					
Luxor	C											1	1					
France: Marseille	C											8						
	D											3						
Plague-infected rats												2						
Hawaii Territory: Hawaii Island—Hamakua—Plague-infected rats																1		
India	C	5,409	3,227	2,319	1,411	240	502	870	1,128	1,120	1,072	938	2,020					
	D	3,498	2,042	1,407	1,231	355	267	531	721	709	571	618	1,203					
Bassein	C	12	13	3	1	1	2	3	2	3	1	4		2			2	
Plague-infected rats		1	1	3	2	1		1				1						
Bombay	C	15	10	6	2		[illegible]		1			1			2	1	1	2
Plague-infected rats		121	103	34	16	3	1			1	2	2		1			1	
Madras Presidency	C		27	23	8													
	D		14	8	6													
Rangoon	C			1	1												2	
Plague-infected rats		1					3						1					
Indo-China (see also table below):																		
Pnom-Penh	D	1	3	6	3	1				1		1	1	1	2			
Saigon and Cholon	C		4	2		1	1				2		1					
Plague-infected rats				3														
Iraq:																		
Baghdad	C			3	2	3	[4] 1	[4] 1	1	1					1	1		1
Basra	C					3												
Madagascar. (See table below.)																		
Morocco	C	33	28	2		5	2	1										
Peru. (See table below.)																		
Senegal. (See table below.)																		
Siam:																		
Bangkok	C		2															
Provinces	C	11			2													
South-West Africa [5]																		
Straits Settlements: Singapore	C		2															
Syria: Beirut	C		1		1			2										
Union of South Africa: Orange Free State	C			7														
United States: California:																		
San Benito County Plague-infected ground squirrels											7		1					
Whittier	C											1						
	D											1						
On vessel: S.S. Kingsborough at port in Argentina	C	1																

[1] Including plague in the United States and its possessions.
[2] For the month of July 1933, 7 cases of plague with 3 deaths were reported in El Mollar, Salta Province, Argentina.
[3] A report dated September 28, 1933, stated that 300 deaths from bubonic plague had occurred since August 1933, in the villages near Nungan, Hunehsin Station, and Paiyintala Manchuria, China.
[4] Imported.
[5] 77 cases of plague with 5 deaths were reported in Ovamboland, South-West Africa, from Jan. 1 to June 30, 1933. Antiplague measures have been taken.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		March 1933	April 1933	May 1933	June 1933	July 1933	August 1933
British East Africa (see also table above):							
Kenya	C	6	6	4	6		
Ecuador	C	3		35			
Indo China							
Cambodia	D	7	6	3	5	3	6
Cochin-China	C	2	5	2		2	4
Madagascar							
Province							
Ambositra	C	155					
	D	154					
Antsirabe	C	63					
	D	62					
Fianarantsoa	C	64					
	D	63					
Maevatanana	C	8					
	D	7					
Madagascar—Continued.							
Province—Continued.							
Miarinarivo	C	9					
	D	9					
Moramanga	C	18					
	D	46					
Tamatave	C	1					
	D	1					
Tananarive	C	175					
	D	168					
Peru	C	7	2	3	5	6	7
Senegal:							
Dakar [6]	C	1	1	2		57	
	D		1	1		39	
Tivaouane [6]	C		1		1		5

[6] Reports incomplete.

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Apr. 30–May 27, 1933	May 28–June 24, 1933	Week ended— July 1933: 1	8	15	22	29	August 1933: 5	12	19	26	September 1933: 2	9	16	23	30
Algeria:																			
Algiers Department	C						2												
Constantine Department	C	1							1										
Arabia: Muscat—Oman Sultanate	C				73														
	D				20														
Belgian Congo	C						2	3							2	2			
	D						1												

Bolivia. (See table below.)																			
Brazil: Porto Alegre (alastrim)	C				6			1					1						
British East Africa:																			
Kenya	C	23	13	4															
Tanganyika	C	43	17	13	10		2		1	3	15	1		5					
British South Africa:																			
Northern Rhodesia	C	21		2						1				1					
Southern Rhodesia	C		8	16				1											
Canada:																			
British Columbia	C		[1]6	[1]1	[1]1														
Manitoba	C													1					
Ontario	C	5		[1]1	[1]1														
Toronto	C		[1]3	1															
Saskatchewan	C	14	[1]2	[1]5	7														
Ceylon:																			
Colombo	C	4	2	4	9	3	1	1		1		7	1	1					
Galle	C		46	2						1									
China:																			
Amoy	C	4	3	3	2														
Canton	C	67	50	7															
	D		2																
Dairen	C	5	1	3	2			3											
Foochow	C	P	P	P	P		P												
Hangchow	C						3				1								
	D						2				1								
Hong Kong	C	169	84	19	8	1	1	1					1						
Macao	C	11	4	4															
Nanking	C	16	2	2	2	1		1											
Shanghai	C	38	39	33	27	3	10	3	3	3	5	3	1	1	2		1		1
Swatow	C	26	16	10	4														
Tientsin	C				16	1	1												
Chosen. (See table below.)																			
Colombia: Buenaventura	D							1											
Dahomey. (See table below.)																			
Ecuador. (See table below.)																			
Egypt:																			
Alexandria	C	277	42	11															
Asyut	C							79	27	6	14		40	55			17		
	D							5	8	10	3		4	4			3		
Beheira	C	132	114	62	6														
Cairo	C	16	10	10	4	1													1
Dakahliya	C							4					1						
Faiyum	C							4	5	35	10	3	3	2			2		
Gharbiya	C	74	88	93	142	18	16	19	9	21	8	1	27	3	4		1		
Girga	C							2				1		1					
Minufiya	C	35	37	128	26														
Port Said	C	6	3																
Qena	C									9	14	4		7			3		
Suez	C	3																	
Provinces	C	284	309	347	287	137	122	111	47	82	50	80	89	78	50	32	33		

[1] For 2 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Apr. 30–May 27, 1933	May 28–June 24, 1933	Week ended— July 1933: 1	8	15	22	29	August 1933: 5	12	19	26	September 1933: 2	9	16	23	30
France. (See table below.)																			
Great Britain:																			
England and Wales	C	71	98	91	71	14	15		4	7	10	5	9	8	4	2	6	4	4
London	C	62	75	79	51	12	12	9	2	5	9	4	7	8	3		5	3	3
London and Great Towns	C	66	85	82	56	13	13	14	3	6	9	5	9	8	3	1	5	3	3
Greece (see also table below): Salonika	C			18			2	2	2	2									
Guatemala. (See table below.)																			
Honduras:																			
Puerto Castilla	C	2																	
Tegucigalpa	C	14	1	7	3														
Tela	C	2	1																
India	C	34,938	40,379	33,876	23,631	3,550	3,320	2,882	2,533	2,314	1,953	1,799	1,774						
	D	8,391	10,288	9,706	7,008	1,019	957	901	768	611	538	410	373						
Bassein	C	13	57	32	16		2	4		3	3	4	1	2	4	1	4	7	
	D	5	14	11	11	1	1	4		2	2	4			3	1		1	
Bombay	C	1,175	510	212	88	14	8	5	2	5	7	3	1	3	1	3	1		
	D	717	286	148	58	10	4	5	2	4	4	2		2		2	1		
Calcutta	C	1,520	921	342	134	20	13	6	7	13	4	6	2	6	4	2	2	2	
	D	1,053	745	289	107	16	10	3	7	13	3	4	1		2			1	
Chittagong	C			1															
	D			1															
Cochin	C	4	3		2	1		2		1					2				
Karachi	C	115	130	52	19	3	4	4	3	2	1	3	1						
Madras	C	666	496	231	144		61	39	71	72	45	37	79	62	63	33	32	36	
Moulmein	C				12														
Negapatam	C	4	6	7	3		4	1	2	5	2	4	3	12	2	2	3		
Rangoon	C	11	15	17	6	2		1	1				1		1		3		
Tuticorin	C		1								2								
Vizagapatam	C	5	4	2	5	2	4	1	1	6	7		3	1				2	
India (French):																			
Chandernagor	D						1												
Karikal	C				5														
	D				5														
Pondichery	C				129	29	46	31		33	46		42	93					
	D				82	18	21	13		21	29		23	18					

Indo-China (see also table below): Saigon and Cholon	C	7	2						1										
Iraq:																			
Baghdad	C	2	2	5															
Basra	C	2		6	2										4				
Japan:																			
Kobe	C	5				1													
Osaka	C	4	8	1															
Tokyo	C	2	6	1	2	27	11	3	4										
Yokohama	C		3																
Mexico (see also table below):																			
Coahuila	C			1	2														
Juarez	C		5	2															
Mexico, D.F.	C	6	11	5	5		1				12								
Monterrey	D			2										1					
Saltillo	D	3	1	2	3														
San Luis Potosi	D		1	5	1	1	2	2	2	2	3	1	3	1					
Torreon	D																		1
Morocco. (See table below.)																			
Nigeria	C	562	1,261				33		642				361						
Nyasaland. (See table below.)																			
Palestine	C						9	4											
Paraguay: Asuncion	D						1	1	1										
Persia	C	26	54	89	31		17		9				12	8					
	D	4	23	62	62		6		3				4	3					
Peru. (See table below.)																			
Poland	C			2	1					1									
Portugal:																			
Lisbon	C	2	2	2	3	1	2		2				1	2			2	1	
Oporto	C	2		2		1		1		1		1							
Siam: Bangkok	D	4																	
Sierra Leone	C	63	22	51	6		15		30		3								
Spain	C						20		21	18		29			11	5			
Sudan (Anglo-Egyptian)	C	32	18	5	1		1	3	1							1			
Syria:																			
Beirut	C	16	2	1	6	1	1	7	3	2	5		16						
Provinces	C	25	40	20	4	6		3			1	1		9	1			3	
Turkey. (See table below.)																			
Union of South Africa:																			
Cape Province	C	P		P															
Orange Free State	C	P	P		P														
On vessels:																			
S.S. Hatasu at Malta	C	1																	
S.S. California at Liverpool	C	1																	
S.S. Kalgan at Bangkok from Swatow	C	1																	
S.S. Nordland at Alexandria	C	1																	
S.S. Hiram at Bangkok	C	1																	
S.S. Arunda at Rangoon from Calcutta	C	1																	
S.S. Haiching at Amoy	C	1																	
S.S. City of Nagpur at Karachi	C		1																

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Apr. 30–May 27, 1933	May 28–June 24, 1933	Week ended— July 1933: 1	8	15	22	29	August 1933: 5	12	19	26	September 1933: 2	9	16	23	30
On vessels—Continued																			
S.S. Rajputana at Aden	C			1															
	D			1															
S.S. Baron Inchcape at Hong Kong	C			P															
S.S. Farnmoor at Vancouver	C				4														
S.S. Egra at Rangoon from Calcutta	C			1															
S.S. Arracan at Newport	C										1								
S.S. Clan Macquarrie at Suez	C														1				
S.S. Sikh at Madras	C													1					
S.S. Lichtenfels at Suez from Calcutta	C																		1

Place		March 1933	April 1933: 1–10	11–20	21–30	May 1933: 1–10	11–20	21–31	June 1933: 1–10	11–20	21–30	July 1933: 1–10	11–20	21–31	August 1933: 1–10	11–20
Dahomey	C				26	2	9		1	1		2	1		6	1
	D				1		2			1		1				1
Indo-China (see also table above)	C	370	107	159	163	58	48	43	60	83	54	74		31	20	38
	D	130	31	30	50	21	14	10	16	36	24	31		6	5	15

Place		March 1933	April 1933	May 1933	June 1933	July 1933	August 1933
Bolivia	C	21	21	28	12	10	
Chosen	C	30	4	34		3	
	D	7	2	14			
Ecuador	C	15		1[1]			
France	C	23	15	21			
Greece	C	4	6				

Place		March 1933	April 1933	May 1933	June 1933	July 1933	August 1933
Guatemala	C		3	1			
Mexico (see also table above)	C					9	
Morocco	C		23	14	10	8	1
Nyasaland	C	177	393	303	218	336	
Peru	C	7	5	6		84	
Turkey	C	1	3		13		

[1] Imported.

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Apr. 30–May 27, 1933	Week ended—																
					June 1933				July 1933					August 1933				September 1933		
					3	10	17	24	1	8	15	22	29	5	12	19	26	2	9	16
Algeria:																				
Algiers Department	C	3	2	14	4			7	1		1	2	3	1	1					
Constantine Department	C	107	219	120	40	34	38	45	18	20	3	14	11	3	8		10	2	4	5
Bone	C	2	3	2									1		1					
Oran Department	C				1				1	1									2	
Basutoland. (See table below.)																				
Bolivia. (See table below.)																				
British East Africa: Uganda	C	12		10	2	2	1	2	1	3					2					
Bulgaria	C	48	9	8		4				1		1			2	1				
Chile	C	102	137																	
Antofagasta	C		1				1													
Santiago	C	1		134	33	85	74	98	72	141	216	221	402	392						
Valparaiso	C							1		1		4	2			8	5	5	8	11
China:																				
Hangchow	C													5						
Nanking	C									1					1					
Shanghai	C									1							1			
Tientsin	C									1										
Czechoslovakia. (See table below.)																				
Egypt:																				
Alexandria	C		6	24	5	5	4	3	9	2	3	1	3	1					1	
Beheira	C	184	443	560	226	111	138	94	42	108	46	41	20	16	21	14	10	7	3	2
Cairo	C	4	42	53	9	12	7		1	1	3	2	2	2	1		1			
Dakahliya	C	196	231	267	47	24	46	23	43	17	11	5	6	8	10	19	5	7	2	1
Damietta	C				1		2			1	2						1	1		
Gharbiya	C	378	331	448	185	132	133	141	97	53	75	56	20	22	10	19	28	11	10	8
Minufiya	C									7	20	12	13	4	20	4	8	1	1	2
Provinces	C	922	1,245	1,611	568	341	381	301	242	199	161	115	68	54	63	56	53	29	22	17
Greece. (See table below.)																				
Guatemala. (See table below.)																				
Hungary	C	5	14	15	7		2	2												
Iraq: Baghdad	C	1	1	2	1		1				1		1		1					
Irish Free State: Waterford County—Lismore	C														1					
Lithuania	C	35	27	31	1	5	8	1		1					8	2	1			
Mexico.																				
Mexico, D.F	C	14	4	15	7	2				2	1	2	1		1			2		
San Luis Potosi	D	1																		
Torreon	C															1			1	1

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		Mar. 5–Apr. 1, 1933	Apr. 2–29, 1933	Apr. 30–May 27, 1933	Week ended— June 1933 3	June 10	June 17	June 24	July 1933 1	July 8	July 15	July 22	July 29	August 1933 5	August 12	August 19	August 26	September 1933 2	September 9	September 16
Morocco	C	46	17	31	19	17	19	8		4		8	2	1	11			1	1	
Palestine	C	3	3					1	18		1		1		2		1	1	1	
Persia	C	28	69	39	7	6	8	4	6		2	8	5	9	4	2				
Peru. (See table below.)																				
Poland	C	335	355	378	96	76	75	75	61	44	38	20	33	27	19	3	7	6	8	12
	D	20	24	21	2	5	2	4	3	2	2	1	3	4		1	1			
Rumania	C	278	238	268	40	36		21		15	11	21								
Syria	C			24	18	2		1	1						1		1			
Trans-Jordan	C	13	8	17	2	2					1	1								
Tunisia:																				
Tunis	C	1	1																	1
Provinces	C	48	52	42	12	36	5	12		20	6	10								
Turkey (see also table below): Istanbul	C	4	1																	
Union of Socialist Soviet Republics. (See table below.)																				
Union of South Africa. (See table below.)																				
Yugoslavia. (See table below.)																				
On vessels:																				
S.S. Chiloe at Antofagasta	C				1															
S.S. Conte Verde at Bombay from Singapore	C			1																

Place		March 1933	April 1933	May 1933	June 1933	July 1933	August 1933
Basutoland	C	37	93	233		208	
Bolivia	C	72	190	98	71	36	
Czechoslovakia	C	9	32	31	9	6	
Greece	C	3	3	12	6	6	
Guatemala	C	11	14	8	3	1	4
Peru	C	41	21	28	23	20	
Turkey (see also table above)	C	8	12	16	13	5	7
Union of Socialist Soviet Republics	C	2,985					
Union of South Africa:							
Cape Province	C	83	130	189	124	195	
Natal	C	1	8	6	122	23	
Orange Free State	C	22	45	15	34	61	
Transvaal	C	3	1	1	7	5	
Yugoslavia	C	12			136	89	

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		Mar. 5-Apr. 1, 1933	Apr. 2-29, 1933	Apr. 30-May 27, 1933	May 28-June 24, 1933	Week ended— July 1933: 1	8	15	22	29	August 1933: 5	12	19	26	September 1933: 2	9	16	23	30
Brazil:																			
Ceara State:																			
Lavras	C				1														
	D				1														
Limoeiro	C		1																
	D		1																
St. Matheus	C				1														
	D				1														
Pernambuco State:																			
Granito	C								2										
	D								2										
Novo Exu [1]	C							1											
	D							1											
Salgueiro	C			1															
	D			1															
French West Africa: Niger Territory	C													2	1				2
	D													2					
Gold Coast	C			2	1											[2] 1			
	D															[2] 1			
Ivory Coast:																			
Bouafle	C				1														
Gagnoa	C				[2] 1														
	D				1														
Senegal:																			
Bakel	C	1																2	
Dagana	C	1																	
	D	1																	
Podor	C	1																	
St. Louis	D						[3] 1												

[1] 2 cases of yellow fever with 2 deaths were reported in Novo Exu, Pernambuco State, Brazil, during the month of June 1933.
[2] Suspected.
[3] Imported.

X

UNITED STATES TREASURY DEPARTMENT

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Preliminary Surveys of the Industrial Environment
A Study of the Health of Workers in a Textile Plant
Deaths in Large Cities During Week Ended October 14
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of public health.

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PUBLIC HEALTH REPORTS

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ENCEPHALITIS: STUDIES ON EXPERIMENTAL TRANSMISSION

By Ralph S. Muckenfuss, *Assistant Professor of Medicine, Washington University School of Medicine, St. Louis*, Charles Armstrong, *Surgeon, United States Public Health Service*, and H. A. McCordock, *Associate Professor of Pathology, Washington University School of Medicine, St. Louis*

MONKEYS

In a preliminary report to the Metropolitan Health Council of St. Louis on September 8, 1933 (1), the authors gave a brief account of what they deemed to be the probable transmission of encephalitis (St. Louis epidemic) to *Macacus rhesus* monkeys.[1] Inoculations have been continued and apparently successful results have been secured from 7 of 15 fatal cases from which the attempt was made. Successful transfers were secured by making heavy inoculations (1.5 cc to 2.0 cc) of a thick brain emulsion intracerebrally, combined with 5 to 10 cc of the same emulsion intraperitoneally. The inoculations were repeated after an interval of 4 to 5 days. The symptoms observed in monkeys, while varying in degree, were uniform in character, and suggested those seen in human encephalitis. The first significant symptoms appeared in from 8 to 14 days following the first inoculation and began with an elevation of temperature, which tended to rise on successive days to a height of from 40.6° C. to 41.6° C. on the fourth or fifth day of the fever. When undisturbed, the animals usually sat hunched up with their eyes closed as if asleep and with the head bent forward. When disturbed, however, the ill animals seemed alert and often markedly excitable. Intention tremors, most noticeable in the forelegs and in the head, usually appeared about the second or third day and were often pronounced. Muscular weakness of one or more extremities and occasionally definite paralyses made their appearance during the febrile stage. Involvement of the eye muscles was not observed. The appetite usually continued good and the animals would often eat greedily throughout the febrile period. Constipation was often present. Spinal fluid at the height of the fever was usually under increased pressure, clear, and commonly showed cell counts of from 150 to 350 cells.

[1] Eight *Cebus* and two Java macaque monkeys proved to be refractory.

The animals were usually sacrificed for transfer on from the second to fifth day of fever, but in a few instances the disease was allowed to run its course. In these instances the monkeys recovered completely. There were no spontaneous deaths, although some animals were apparently very ill when sacrificed and it seemed probable that some of them might have succumbed had they not been killed.

Three strains have now been successfully carried through 5 passages in monkeys with incubation periods varying from 8 to 21 days. Only about 40 percent of inoculated monkeys developed symptoms, although the acuteness of the illness in animals coming down during the fourth and fifth transfers suggests that the virulence may be increasing.

A few attempts to convey the disease by means of nasopharyngeal washings, spinal fluid, and blood have failed. This can hardly be taken to mean, however, that the virus is absent from these fluids, since the susceptibility of the monkey is apparently low.

The pathological picture is consistent with that seen in human cases during the epidemic and includes marked congestion with perivascular round cell infiltration, together with some nerve cell destruction, scattered diffusely through the brain, bulb, and cord.

The virus persists in 50 percent glycerin for at least one week.

WHITE MICE

Attempts to transfer the disease to various other species of laboratory animals were without suggestive results except in the case of white mice.

We were informed by Dr. L. T. Webster, of the Rockefeller Institute for Medical Research, that a virus had been encountered by intracerebral inoculation of material from human encephalitis, furnished to him, into a strain of mice bred in his laboratory. Accordingly, stock mice were inoculated intracerebrally with brain emulsions of second passage monkeys. About 50 percent of these mice died after an incubation period of 5 to 7 days, and passage from these into other mice resulted in the uniform development of the disease. The course of illness in these animals and the pathological appearance were apparently similar to those observed by Dr. Webster in his special strains of mice.

RABBITS

A number of rabbits were inoculated intracerebrally with brain emulsion, spinal fluid, and blood, but no evidence of illness appeared in any of them. In addition to this lack of success in attempts at transmission to rabbits, the failure to secure positive results in eight *Cebus* monkeys following intracerebral inoculation with brain emulsions from

the *Rhesus* monkeys is further indication that herpes virus did not play an etiological role in the St. Louis epidemic.

Further studies on the strains of virus isolated are in progress.

REFERENCE

(1) Leake, J. P.: Jour. Am. Med. Assoc. (1933) 101: p. 928.

PRELIMINARY SURVEYS OF THE INDUSTRIAL ENVIRONMENT

By J. J. BLOOMFIELD, *Sanitary Engineer, Office of Industrial Hygiene and Sanitation, United States Public Health Service*

In the study of industrial health problems it is necessary to accumulate certain fundamental data which may serve in the interpretation of these problems on a scientific basis. One outstanding example of such studies has been the investigations of the United States Public Health Service in connection with the influence of the inhalation of atmospheric dust on the health of workers in industrial environments. In all such investigations there are certain preliminary steps of fundamental importance which must be undertaken in order to serve as a guide in the more detailed studies to follow. Roughly, these preliminary steps may be divided into two parts—(1) the Sanitary Survey and (2) the Occupational Analysis.

The present contribution deals with the methods used in conducting a sanitary survey and occupational analysis of an industrial environment and attempts to show the need for such preliminary studies as a groundwork for the more detailed investigations which may be undertaken.

THE SANITARY SURVEY

The sanitary survey of the workroom environment may be likened to the inventory of materials and stock which a business establishment usually undergoes annually. The sanitary survey may well be regarded as a listing of the facilities afforded the workers while in the industrial environment. When one realizes that one third of the worker's day is spent in this environment, he clearly sees the necessity for a study of all those factors which bear on the health of the industrial worker.

United States Public Health Service—Field investigations

1. City ---------- Establishment ---------- Date ----------
Type of building ---------- Shop ---------- Location ----------
Size ---------- Crowded ----------
2. Ventilation—Natural ---------- Ample ---------- Deflectors ---------- Artificial ----------

					Remarks:
Temperature					
Dry					
Wet					
Hum					

3. Illumination—Natural ---------- General impression ---------- Maximum distance from window ---------- Window space ---------- Ratio to floor space ---------- Type of window ---------- Condition ---------- Artificial—Type and No. ---------- Shadows or glare ---------- General impression ----------
4. General conditions—Refuse cans ---------- Cuspidor service ---------- Sweeping service ---------- Fire protection ---------- Fire escapes ---------- Coat rooms ---------- Washing facilities ---------- Eating facilities ---------- Toilet facilities—Type and No. ---------- Light ---------- Ventilation ---------- Condition ---------- Ample ---------- Male ---------- Female ---------- Drinking water ----------
5. Safety hazards:
6. Fumes and gases:
7. Dust:
8. Specific poisons:
9. Exposure to heat or cold:
10. Fatigue:
11. Excessive noise:
12. Employees:

Process	Raw material	Finished product	Employee	Day shift: Skilled M	Day shift: Skilled F	Day shift: Unskilled M	Day shift: Unskilled F	Night shift: Skilled M	Night shift: Skilled F	Night shift: Unskilled M	Night shift: Unskilled F	Method of payment	Seats and backs	Replaceable by females	Hazards	Rest period	Exercise period
			Total									Employees at Full Prod'n.				Color	

Absenteeism and labor turnover:

Remarks:

In the course of certain studies conducted in munition plants during the World War, Winslow and Greenburg (1) devised an inspection form which proved very useful in their studies of factory workrooms. For the past 9 years we have utilized this form in numerous investigations in industrial establishments throughout the United States, and have found that in nearly all instances the filling out of this form has proved a valuable guide and starting point in the study of the workroom environment. Since this form has already been discussed in detail elsewhere, it is only necessary at this time to state

briefly that under items 1 to 4 provision has been made to record general sanitary and hygienic data concerned chiefly with the workrooms. Under items 5 to 11 are noted those industrial hazards created more particularly by special processes and materials used in these processes. The reverse side of the inspection card deals mainly with the occupational analysis and will be discussed in more detail in the section of this paper dealing with this subject.

In practice the sanitary survey consists in carefully filling out the inspection form and jotting down any additional notes on items which may not be provided for in the form. Under certain conditions, such as may exist in a coal mine, or a cement mill, some of the items listed on the card may obviously be omitted. After filling out a survey card for each workroom in the entire plant, a detailed analysis of the data contained on the cards is then in order. It is such an analysis that enables one to form a picture of the hygienic conditions in each of the workrooms studied and in the plant as a whole.

One or two illustrations of an analysis of data obtained in a sanitary survey of a plant will suffice to clarify the technique involved in such an analysis. Reference to the inspection form shows that, under item 1, the size of each workroom is obtained and that, under item 12, the workroom population at full production is also recorded. Table 1 presents a survey of 50 workrooms and illustrates how the data on space allotment was handled.

TABLE 1.—*Distribution of workrooms according to per capita space allotment*

Square feet floor area per capita	Less than 25.	25 to 50	50 to 100	100 to 150	150 to 200	More than 200.
Number of rooms in each group	3	2	15	20	8	2.
Cubic feet per capita	Less than 250.	250 to 500	500 to 1,000	1,000 to 1,500.	1,500 to 2,000.	More than 2,000.
Number of rooms in each group	2	3	12	23	7	3.

According to the tentative code of the United States Public Health Service on workroom sanitation, 25 square feet of floor area per capita, or 250 cubic feet of air space per capita, may be considered as a fairly ample space allotment. In the light of these standards, the figures presented in table 1 show that 3, or 6 percent, of the rooms did not fulfill the requirement for area allotment, and that 4 percent of the rooms did not meet the standard for per capita cubic content. Similar analyses may be carried out for the other items listed in the survey form.

Several years ago, in studying the dust hazard in a modern factory, we thought it best to conduct a sanitary survey of the numerous workrooms in this factory in order to be able to locate the dusty workrooms and processes and to plan the dust-sampling schedules intelligently. As a result of such a sanitary survey, numerous safety

hazards were encountered in the various workrooms, and in addition a lead and benzol hazard (unknown to the plant officials) was also disclosed.

To recapitulate, the sanitary survey of workrooms in any plant yields definite information concerning the presence and extent of various health hazards and often serves as a guide in establishing which hazards require further study in the form of actual quantitative analyses, such, for example, as the determination of hydrogen sulphide in the spinning room of a rayon silk manufacturing plant using the viscose process. It is fully realized that many problems arise in industry for which there is no simple solution. Others require considerable expenditure of funds and ingenuity for their complete eradication. On the other hand, a sanitary survey of a factory will often disclose many minor conditions which require very little expenditure of money and effort to correct. The solution of such small problems may eliminate sources of ill health or unpleasantness to the industrial worker, so that the worker and, in the end, the plant management are the ones to benefit.

THE OCCUPATIONAL ANALYSIS

A very important part of any study of workroom environment is the occupational analysis, which permits one to learn of the activities involved and the particular hazards associated with each occupation. Such an analysis also discloses the number of persons in each occupation, which gives an idea of the importance of each hazard from the viewpoint of the numbers involved. Perhaps a typical example of such an analysis will serve to portray the value of the occupational analysis. For the sake of simplicity, an analysis of workrooms in which only one major hazard was found to exist is presented here, namely, the occupations involved in granite-cutting plants. Table 2 shows the various occupations followed in 14 typical granite-cutting plants (2).

TABLE 2.—*Analysis by occupation of certain granite-cutting sheds*

Occupation	Number of men	Occupation	Number of men
Granite cutters:		Sawyers	
Pneumatic-tool workers	565	Engineers	
Surfacing-machine operators	68	Firemen	
Sand-blast operators	4	Draftsmen	
Carvers and letterers	24	Foremen	
Lathe operators and others	41	Blacksmiths	
Tool grinders	20	Carpenters	86
Lumpers		Night watchmen	
Boxers		Clerks	
Cranemen		Salesmen	
Polishers		Superintendents	
Bed setters	164	Manufacturers	
Tool carriers			
Machinists		Total	972
Laborers			
Stone washers			

There are several important facts to be derived from a study of the occupations in granite-cutting plants, such as in the analysis presented in table 2. First, the processes involved in granite stonecutting may be divided roughly into two parts; namely, those occupations dealing with the actual cutting of the stone and the additional labor necessary for the conduct of the former processes. Examination of table 2 shows that under the heading of granite cutters there are five general occupations. Also by far the greatest number of persons are engaged in tasks involving the production of dust (72 percent). Furthermore, it shows that 565 of the 702 persons creating dust are engaged in work involving the use of the hand pneumatic tool, a device well known to be productive of enormous quantities of dust. It is at once obvious from such an analysis that considerable time should be devoted to the study of the dust exposure of granite cutters in general and of hand pneumatic tool workers in particular. The results of such a study are presented in table 3.

TABLE 3.—*Ranking the various occupations in the granite-cutting industry according to dust exposure*

Occupation	Number of men exposed	Number of observations	Dust count in millions of particles per cubic foot		
			Minimum	Maximum	Average
All pneumatic hand tool operators	565	56	2.4	201.0	59.2
Surface cutters, inside	58	34	.6	165.7	44.0
Surface cutters, outside	10	10	14.0	102.2	43.9
Carvers and letterers	24	20	11.7	99.8	37.0
Tool grinders	20	14	6.3	62.0	27.1
General plant atmosphere	121	42	2.5	64.0	20.2
Lathe operators	4	4	6.0	25.7	17.9
Polishers	43	16	1.3	26.8	9.0
Sandblast operators	4	6	1.9	13.4	6.2
Sawyers	10	4	4.0	4.9	4.6
Blacksmiths and others	103	5	.9	8.2	2.5
Office employees	10	4	1.5	2.4	1.9

As a result of a prolonged study of the health of the workers engaged in the various occupations of granite cutting, it was possible to demonstrate that those persons engaged for many years in tasks associated with a dust exposure of less than 10 million particles per cubic foot of air were not suffering from silicosis or tuberculosis, the diseases most prevalent among these granite cutters. It was also possible to demonstrate that among these granite cutters the incidence of silicosis and tuberculosis, all other factors being equal, was directly proportional to the degree of dust exposure.

The importance of an occupational analysis from the viewpoint of determining the extent of an occupational hazard is at once obvious. Such an analysis is of still greater importance in the subsequent steps necessary for the elimination of a condition known to be inimical to health. Unless one knows definitely which occupations in a work-

room, containing many diverse processes and activities, are associated with unhealthful conditions, it is impossible to map out a constructive and effective program of prevention We have just seen that, in the case of the granite-cutting study, the problem resolves itself to keeping the dust content of the workroom air below the level of that associated with those occupations found to be free from silicosis and tuberculosis, even after many years of industrial exposure; namely, those occupations exposed to less than 10 million particles of dust per cubic foot of air. The same technique may be applied to other industrial problems which, on first examination, seem more difficult of solution than the case just cited. Perhaps another single illustration from our experience will demonstrate the value of the occupational analysis as a guide in the elimination of industrial health hazards.

Studies of industrial morbidity made by the United States Public Health Service (3) indicate that the greatest percentage of lost time in industry is caused by respiratory disease. One of these studies showed that pneumonia, in all forms, occurred in nearly twice the amount among iron and steel workers as it did among the employees of other industries during a 3-year period of observation. A 5-year inquiry into the causes of high pneumonia sickness rates among iron and steel workers in a representative mill disclosed the fact that the largest number of pneumonia cases occurred in certain departments, such as in the blast furnace and open-hearth steel-making plants. When one realizes, however, that these departments contain anywhere from 60 to 100 different occupations, the task of a preventive program is a hopeless one unless definite information is obtained concerning such important factors as (1) the number of persons in each occupation, (2) the activities associated with each occupation, (3) the health hazards associated with each occupation, and (4) the incidence of pneumonia for each occupation. Such information is available from an occupational analysis of each department. For example, in the iron and steel plant under consideration, morbidity statistics for the period of 1924–27 showed that 38 cases of pneumonia occurred among the 1,637 bituminous coal miners employed during the same period in the mines operated in connection with this iron and steel plant. An occupational analysis disclosed the fact that there were 69 different occupations in the mines and that 33 of the total of 38 pneumonia cases were associated with only two occupations, those of pick mining and the loading of coal. The pneumonia rate per 1,000 men for miners and loaders was shown, by this study to be 31, whereas the rate for all other mine workers was found to be only 8.5 per 1,000. It is quite obvious, therefore, that of the 69 occupations involved in the mining of coal, our attention should be concentrated on the activities of coal miners and loaders in an attempt to determine

those factors in the industrial process and environment which contribute to the high pneumonia incidence experienced by these workers.

Having determined which occupations in a certain industrial environment are of sufficient importance to be studied in detail, the next step in our occupational analysis is the study of the various activities and processes involved in each occupation, in an effort to evaluate the importance of each activity in the problem at hand. Such a detailed study often reveals the necessary steps to be taken in a solution of the problem.

For example, experience has taught us that the various operations comprising the processes of most dusty occupations are usually associated with dissimilar dust exposures. For this reason it is essential to estimate the amount of time spent in each activity in any one occupation and to determine the dust exposure for each activity in that occupation. Let us take the case of a Leyner driller in a granite-cutting quarry. Table 4 presents a summary of the dust exposure of Leyner drillers in a typical granite quarry.

TABLE 4.—*Summary of dust exposure of Leyner drillers in a granite quarry*

Activity	Average dust exposure in millions of particles per cubic foot of air (a)	Number of hours spent in each activity (b)	Particle-hours in millions per cubic foot (a×b)
Drilling	213.4	4	853.6
Changing drills	9.8	1	9.8
Watching drills	8.0	2	16.0
Broaching	6.0	¾	4.5
Blowing off holes	1,085.0	¼	271.3
Total		8	1,155.2

$$\frac{1{,}155.2 \text{ particle-hours in millions per cubic foot}}{8 \text{ hours}} = 144.4 \text{ million particles per cubic foot}$$

It will be seen from table 4 that a Leyner driller has five different dust exposures. A differential analysis, such as the one presented in table 4, yields several valuable findings. First, it enables one to obtain a true average dust exposure for workers engaged in the occupation of Leyner drilling. (In this case the weighted average is 144.4 as contrasted with 213.4 million particles per cubic foot found during drilling operations only.) Second, it enables one to determine which activity, or activities, contribute the most to the dust hazard. In this instance it is quite evident that the practice of blowing-off holes by means of inserting a compressed air line into each hole is attended with an exceedingly great amount of dust; and though it is an activity lasting but 15 minutes of the 8-hour working day, it is one

which is responsible for 23 percent of the total dust exposure. It is evident that 23 percent of the Leyner driller's dust exposure may be at once eliminated by the prohibition of this practice. (Dust removal devices, such as the Kelley dust trap have not, at this writing, come into use in granite quarries.) And lastly, such an analysis indicates the necessity for devoting all one's efforts to the removal of dust during the drilling process, since this activity accounts for 74 percent of the total dust exposure, although a Leyner driller spends but one half of the working day at his drill.

In practice, the making of an occupational analysis has for its basis the filling out of item 12 of the survey form. The data obtained cover such subjects as the manufacturing process, the raw materials entering into the process, and the finished product associated with the occupation of each employee. To obtain such data makes it necessary for the investigator to become thoroughly familiar with the activities of each occupation and the processes of the workroom as a whole. One must not take anything for granted in a study of this sort. For example, in a study of the hazards involved in the application of radium paint to watch and clock dials in a certain workroom, one of the employees listed was the foreman supervising the work of the radium dial painters. Upon close observation and questioning it was discovered that this worker, in addition to allotting and supervising the work of each painter, spent one hour a day in mixing paint for all the dial painters and once a month blended various radium powders in such a manner that he was exposed to the inhalation of enormous quantities of radioactive dust. This latter brief exposure to radioactive dust was of far more significance from the viewpoint of radium poisoning than his total exposure to radio-active dust during his supervisory duties.

The remaining subjects listed under item 12 of the survey form are all of a simple nature, but are often of assistance in presenting a complete picture of the workroom environment, and at times serve to explain certain unusual phenomena. Take, for example, the subject of labor turnover. In a certain lead storage-battery factory the plant officials pointed to the small number of lead poisoning cases occurring in their plant to show that this disease was not an important problem in their workrooms. Investigations of the workroom atmosphere disclosed that in the lead mixing and pasting rooms of this plant enormous quantities of lead dust were present, quantities sufficient to produce lead poisoning in a comparatively brief period of exposure, as judged by our present knowledge of lead poisoning. Further inquiries revealed the fact that the labor turnover in these two workrooms was very great, in fact so great that the men left employment before really serious symptoms of lead poisoning manifested themselves among the workers. Whether or not such practice

is commendable or sound economic procedure is not within the province of this discussion. Suffice it to say that the presence of a high labor turnover in times of normal production is often highly suggestive of unhealthful or unpleasant working conditions.

The remaining subjects under the item dealing with employees, need no further comment, since their purpose will be quite obvious to the average investigator. It is often very helpful to obtain a sketch or blueprint of the workroom layout, on which may be noted such important items as the location of ventilating systems, points of sampling, and any other data bearing on the problem under study. This data may then be used in the subsequent steps of an investigation of this type, namely, the recommendations necessary to eradicate certain unhealthful or unpleasant conditions which the study may have disclosed.

REFERENCES

1. Winslow, C.-E. A., and Greenburg, Leonard: A Useful Factory Inspection Form. Pub. Health Repts., vol. 37, no. 1, Jan. 6, 1922.
2. Pub. Health Bull. No. 187, U.S. Public Health Service, 1929.
3. Brundage, D. K., and Bloomfield, J. J.: The Pneumonia Problem in the Steel Industry. Jour. Ind. Hyg., vol. 14, no. 10, December 1932.

THE HEALTH OF WORKERS IN A TEXTILE PLANT

A report has recently been issued by the Public Health Service on the health of workers in a cotton-cloth manufacturing plant [1] (carding, spinning, and weaving rooms). The investigation included an occupational analysis, sanitary survey, determination of dust concentration; dry- and wet-bulb temperature readings every 2 hours throughout the 24 for the period of the study; sickness records by cause and duration; complete physical examination of a large percentage of the workers.

In view of the low concentrations of dust encountered, it became apparent that no adverse effect on health was to be anticipated from this source. The high temperatures and humidities to which the workers were subjected were found to be the most important health factors in the occupational environment, and this fact made it desirable to deal with these conditions in a separate report. The report of the results of the dust study is included in another bulletin,[2] being a contribution to the studies of workers in dusty trades.

The study gives a fairly accurate picture of the temperature and humidity conditions which one may expect to find in a textile plant

[1] The Health of Workers in a Textile Plant, by Rollo H. Britten, J. J. Bloomfield, and Jennie C. Goddard. Public Health Bulletin No. 207. July 1933.

[2] Health of Workers in Dusty Trades. IV. Exposure to Dust in a Textile Plant, by J. J. Bloomfield and W. C. Dreessen. Public Health Bulletin No. 208.

in the Southern States in which air conditioning (apart from the introduction of moisture) is not used. In spite of the uncomfortable conditions demonstrated to exist, especially in the weaving rooms, no definite effect on health was established. Thus the observation by English investigators to the effect that there was no excess of sickness in the humid sheds as compared with the nonhumid sheds seems to be borne out in this study, although workers in this investigation were exposed to a much more severe condition of temperature and humidity.

The most important specific findings are as follows:

All room-groups show distinctly lower temperatures in the winter; but it is notable that the averages even in winter are never less than 80°.

As would be expected, in view of the use of artificial humidification in the weaving rooms, a much higher relative humidity (about 85 percent) was found in these rooms than in the others (52 to 58 percent).

During the summer the average effective temperature in all the rooms showed a condition which would be expected, on the basis of comments in the literature, to have a bad effect on health. The winter readings in the weaving rooms are of the same magnitude as the summer readings in the other rooms.

The rate of illness for cases of all durations was higher than that found in other studies of this nature. However, the rate of cases of 8 days' duration and longer and for serious conditions (such as tuberculosis, pneumonia, etc.) was very low. The sickness rate was definitely higher for night workers than for day workers.

From the physical examinations the only respiratory rate showing percentages of striking nature is that of nasal pharyngeal catarrh (from 22 to 45 percent by room). There was a definite tendency for the workers to be under the average weight of American industrial workers. This tendency was not more pronounced, however, with increasing length of service.

COURT DECISION RELATING TO PUBLIC HEALTH

Interference with township board of health in clearing out ditch enjoined.—(New Jersey Court of Chancery; *Board of Health of Caldwell Township* v. *Shaw et al.*, 167 A. 869; decided Aug. 2, 1933.) Suit was brought to enjoin the defendants from interfering with the relators, the board of health of Caldwell Township, in clearing out a ditch through the land of defendants. The ditch, with the exception of that part on defendants' land, had been cleared out by the relators, but they were prevented by the defendants from completing the work. The portion running through defendants' land had been partly filled up with debris and had been filled in in one part by the defendants so as to enable them to cross it. As a result, pools of stagnant water

formed on defendants' land, constituting breeding places for mosquitoes. The relators introduced testimony to the effect that clearing out the ditch and removing the obstruction, in connection with the work already done elsewhere, would give a sufficient fall to drain the land in question, and they offered not only to do this work at their own expense but to put in a suitable culvert over the ditch so as to provide a proper crossing for defendants' wagons.

The defendants resisted the suit on the ground that the conditions did not constitute a nuisance within the meaning of the statute conferring power upon the chancery court to grant relief to abate a nuisance on suit by the board of health, conferred by sections 28 and 29 of the health act (2 Comp. St. 1910, pp. 2668, 2669, secs. 28, 29). They also contended that the suitable and proper way to drain the tract was by another and shorter ditch in another direction. The vice chancellor, in holding that a decree would be advised granting to relators the relief prayed for, said:

I think it is clear from the statutes that the conditions described constitute a nuisance within the meaning of the cited sections of the health act. It was shown to my satisfaction that the creation of the pools of stagnant water are hazardous to public health because of their furnishing breeding grounds for mosquitoes. It has been held that conditions hazardous to the public health referred to in the statutes need not necessarily mean those proven to be actually injurious but likely to become a menace to health. *Board of Health* v. *Schmidt*, 83 N.J. Eq. 35, 90 A. 239.

DEATHS DURING WEEK ENDED OCT. 14, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Oct. 14, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	7,095	7,128
Deaths per 1,000 population, annual basis	9.9	10.2
Deaths under 1 year of age	545	542
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	46	45
Deaths per 1,000 population, annual basis, first 41 weeks of year	10.8	11.1
Data from industrial insurance companies:		
Policies in force	67,564,991	70,259,724
Number of death claims	9,661	10,494
Death claims per 1,000 policies in force, annual rate	7.5	7.8
Death claims per 1,000 policies, first 41 weeks of year, annual rate	9.8	9.6

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Oct. 21, 1933, and Oct. 22, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Oct. 21, 1933, and Oct. 22, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Oct 21, 1933	Week ended Oct. 22, 1932	Week ended Oct. 21, 1933	Week ended Oct. 22, 1932	Week ended Oct. 21, 1933	Week ended Oct. 22, 1932	Week ended Oct. 21, 1933	Week ended Oct. 22, 1932
New England States:								
Maine	3	3			1		0	1
New Hampshire					2		0	0
Vermont							0	0
Massachusetts	34	20		2	46	51	0	2
Rhode Island	1	10		1	1		0	0
Connecticut	1	1	5	2	1	7	0	0
Middle Atlantic States:								
New York	53	56	[1] 10	[1] 15	140	123	2	4
New Jersey	25	24	5	23	13	82	2	1
Pennsylvania	70	107			52	148	4	2
East North Central States:								
Ohio	60	87	5	5	22	38	0	0
Indiana	125	108	37	26	6	6	3	0
Illinois	51	123	9	21	19	33	7	5
Michigan	27	23	4	11	7	46	1	0
Wisconsin	7	17	25	30	19	27	0	0
West North Central States:								
Minnesota	17	31			2	67	0	2
Iowa [3]	20	23				4	0	0
Missouri [2]	85	74	3		4	15	1	0
North Dakota	3	1	1			9	0	0
South Dakota	2	7			26	3	0	0
Nebraska	2	33	1	1	1		0	0
Kansas	34	46		2	5	7	2	0
South Atlantic States:								
Delaware	2	6			1	2	0	0
Maryland [3]	30	20	6	4	2	4	0	1
District of Columbia	9	2	1	1	1	3	0	0
Virginia	159	72			11	31	0	0
West Virginia	99	82	15	13	1	32	2	1
North Carolina	186	92	15	5	25	42	2	0
South Carolina [3]	50	31	291	379	26	3	0	0
Georgia [3]	60	70			48	2	1	0
Florida [3]	12	20	1	3	2	2	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Oct. 21, 1933, and Oct. 22, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Oct. 21, 1933	Week ended Oct. 22, 1932	Week ended Oct. 21, 1933	Week ended Oct. 22, 1932	Week ended Oct. 21, 1933	Week ended Oct. 22, 1932	Week ended Oct 21, 1933	Week ended Oct. 22, 1932
East South Central States:								
Kentucky	198	77		6		12	0	0
Tennessee	116	108	63	33	76	1	1	3
Alabama [3]	75	110	9	27	9	3	0	0
Mississippi [2]	36	44					0	0
West South Central States:								
Arkansas	30	58	15	36	24	1	0	0
Louisiana	51	31	10	6	3	1	1	1
Oklahoma [4]	64	99	11	33	12	3	0	0
Texas [3]	233	233	72	54	8	10	2	0
Mountain States:								
Montana	2	1			4	208	0	0
Idaho		9	1		1		0	0
Wyoming		1			1	4	1	0
Colorado	13	8			6	2	1	0
New Mexico	12	54	1	12	14	2	0	0
Arizona	1	4	5	61	10		0	0
Utah [2]	3	1	2		12	2	0	0
Pacific States:								
Washington	8	1			12	2	2	0
Oregon		2	19	56	7	11	0	0
California	51	60	32	450	208	21	1	0
Total	2,120	2,090	674	1,318	900	1,070	36	23

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Oct. 21, 1933	Week ended Oct. 22, 1932	Week ended Oct. 21, 1933	Week ended Oct. 22, 1932	Week ended Oct. 21, 1933	Week ended Oct. 22, 1932	Week ended Oct. 21, 1933	Week ended Oct. 22, 1932
New England States:								
Maine	6	6	9	18	0	1	4	9
New Hampshire	0	0	26	4	0	0	2	0
Vermont	7	0	12	2	0	0	0	0
Massachusetts	4	0	137	204	0	0	4	6
Rhode Island	0	0	10	30	0	0	0	1
Connecticut	3	0	46	32	0	0	2	0
Middle Atlantic States:								
New York	31	9	227	240	0	7	27	24
New Jersey	9	12	71	111	0	0	10	8
Pennsylvania	10	32	339	279	0	0	44	50
East North Central States:								
Ohio	16	1	182	412	0	0	27	32
Indiana	1	1	148	116	0	1	12	19
Illinois	6	8	306	316	0	2	31	36
Michigan	3	6	218	197	1	0	22	19
Wisconsin	5	2	53	45	0	0	2	2
West North Central States:								
Minnesota	13	4	47	58	2	0	6	2
Iowa [1]	4	2	66	37	0	3	5	18
Missouri [1]	2	0	108	148	1	0	9	22
North Dakota	3	0	2	7	0	1	1	2
South Dakota	1	0	12		1	0	1	1
Nebraska	1	0	12	39	0	5	1	2
Kansas	0	2	141	82	1	0	5	1
South Atlantic States:								
Delaware	0	0	2	8	0	0	3	2
Maryland [2]	2	1	71	60	0	0	24	14
District of Columbia	0	4	10	16	0	0	5	0
Virginia	1	4	171	88	0	0	25	23
West Virginia	4	1	131	70	20	1	38	42
North Carolina	1	1	182	98	0	0	12	5
South Carolina [3]	1	0	19	13	0	0	17	15
Georgia [3]	1	2	33	36	0	0	27	37
Florida [2]	0	2	1	6	0	0	9	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Oct. 21, 1933, and Oct. 22, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Oct. 21, 1933	Week ended Oct. 22, 1932	Week ended Oct. 21, 1933	Week ended Oct. 22, 1932	Week ended Oct. 21, 1933	Week ended Oct. 22, 1932	Week ended Oct. 21, 1933	Week ended Oct. 22, 1932
East South Central States:								
Kentucky	1	0	205	66	4	0	31	20
Tennessee	1	1	146	100	2	0	36	22
Alabama [3]	0	0	51	69	0	1	11	18
Mississippi [2]	0	0	44	26	0	1	3	4
West South Central States:								
Arkansas	0	0	28	47	0	0	8	9
Louisiana	0	0	19	20	0	1	28	13
Oklahoma [4]	1	0	27	22	0	0	41	24
Texas [3]	1	1	105	66	5	4	86	18
Mountain States:								
Montana	0	0	28	8	0	4	7	9
Idaho	0	0	2	1	1	0	0	6
Wyoming	0	0	8	15	0	0	0	3
Colorado	0	0	21	25	10	0	2	1
New Mexico	0	0	22	13	0	0	20	12
Arizona	0	0	7	5	0	0	2	1
Utah [2]	2	0	10	1	0	0	0	0
Pacific States:								
Washington	6	0	23	15	3	2	3	5
Oregon	4	4	43	21	5	0	2	3
California	8	4	165	79	2	1	18	14
Total	159	110	3,746	3,397	58	35	673	576

[1] New York City, only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Oct. 21, 1933, 62 cases, as follows: South Carolina, 1; Georgia, 25; Florida, 4; Alabama, 22; Texas, 10.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
September 1933										
Arizona	1	14	11	4	21		2	28	3	34
Delaware	2	5	1		4		0	24	0	10
Idaho		1	6				0	18	23	4
Illinois	12	97	20	51	63		56	496	1	122
Louisiana	4	66	20	502	8	24	4	31	0	75
Maryland	1	49	26	3	9	4	9	120	0	91
Minnesota	2	34	6	1	23		124	106	2	15
Montana		19	14		5		4	52	0	30
New Mexico		28	3	28	6	1	2	31	2	66
Pennsylvania	13	142		2	108		136	571	0	216
Puerto Rico		54	61	3,745	75		0		0	44
Rhode Island		4		1	4		5	47	0	1
Wisconsin	6	14	82	2	73		14	113	12	11

September 1933

	Cases
Actinomycosis:	
Minnesota	1
Montana	1
Anthrax:	
Pennsylvania	3
Chicken pox:	
Arizona	1
Delaware	2
Idaho	16

September 1933—Continued

	Cases
Chicken pox—Continued.	
Illinois	109
Maryland	35
Minnesota	59
Montana	37
New Mexico	5
Pennsylvania	166
Puerto Rico	21
Rhode Island	11
Wisconsin	198

September 1933—Continued

	Cases
Diarrhea:	
Maryland	47
Dysentery:	
Arizona	16
Illinois (amebic)	16
Illinois (bacillary)	27
Louisiana	5
Maryland	49
Minnesota (amebic)	4
Minnesota	1

September 1933—Continued

	Cases
Dysentery—Continued.	
Montana	50
New Mexico	24
Pennsylvania	4
Puerto Rico	212
Favus:	
New Mexico	1
Filariasis:	
Puerto Rico	41
Food poisoning:	
New Mexico	1
German measles:	
Arizona	1
Illinois	38
Maryland	4
Montana	2
New Mexico	1
Pennsylvania	18
Wisconsin	4
Hookworm disease:	
Louisiana	7
Impetigo contagiosa:	
Arizona	10
Illinois	4
Maryland	128
Montana	6
Lead poisoning:	
Illinois	3
Maryland	1
Leprosy:	
Maryland	1
Puerto Rico	1
Lethargic encephalitis:	
Arizona	2
Illinois	95
Louisiana	1
Minnesota	13
New Mexico	1
Pennsylvania	20
Rhode Island	2
Wisconsin	4
Mumps:	
Arizona	9
Delaware	2
Illinois	96
Louisiana	1
Maryland	23
Montana	3
New Mexico	10
Pennsylvania	171
Puerto Rico	63

September 1933—Continued

	Cases
Mumps—Continued.	
Rhode Island	2
Wisconsin	35
Ophthalmia neonatorum:	
Illinois	8
Maryland	1
Pennsylvania	7
Puerto Rico	9
Paratyphoid fever:	
Idaho	1
Illinois	4
Louisiana	2
New Mexico	2
Puerto Rico	1
Psittacosis:	
Minnesota	1
Puerperal septicemia:	
Illinois	2
Pennsylvania	20
Puerto Rico	5
Rabies in animals:	
Illinois	9
Louisiana	4
Maryland	5
Rhode Island	1
Rabies in man:	
Illinois	1
Rocky Mountain spotted fever:	
Montana	1
Scabies:	
Maryland	2
Montana	1
Septic sore throat:	
Arizona	7
Illinois	11
Louisiana	8
Maryland	4
Montana	1
New Mexico	3
Rhode Island	1
Tetanus:	
Delaware	1
Illinois	6
Louisiana	1
Maryland	1
New Mexico	1
Pennsylvania	9
Puerto Rico	11
Tetanus, infantile:	
Puerto Rico	20

September 1933—Continued

	Cases
Trachoma:	
Arizona	118
Minnesota	1
Pennsylvania	1
Puerto Rico	16
Wisconsin	2
Trichinosis:	
Illinois	1
Minnesota	1
Pennsylvania	4
Tularaemia:	
Illinois	4
Louisiana	3
Minnesota	1
Montana	2
Wisconsin	1
Typhus fever.	
Illinois	1
Maryland	2
Undulant fever:	
Arizona	6
Delaware	1
Idaho	2
Illinois	8
Louisiana	6
Minnesota	5
Montana	1
New Mexico	1
Pennsylvania	5
Wisconsin	3
Vincent's angina:	
Illinois	15
Maryland	14
Montana	4
Whooping cough:	
Arizona	59
Delaware	15
Idaho	6
Illinois	455
Louisiana	20
Maryland	218
Minnesota	191
Montana	51
New Mexico	53
Pennsylvania	1,118
Puerto Rico	135
Rhode Island	142
Wisconsin	752

WEEKLY REPORTS FROM CITIES

City reports for week ended Oct. 14, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	0	2	1	0	0	0	3	26
New Hampshire:											
Concord	0	------	0	0	0	0	0	0	0	0	6
Manchester	0	------	0	0	0	0	0	0	0	0	9
Nashua	0	------	0	0	0	1	0	0	0	0	------
Vermont:											
Barre	------	------	------	------	------	------	------	------	------	------	------
Burlington	0	------	0	0	0	0	0	0	0	3	11
Massachusetts:											
Boston	5	------	1	6	15	21	0	11	0	36	187
Fall River	0	------	0	0	0	0	0	1	0	4	24
Springfield	0	------	0	2	2	1	0	1	0	9	32
Worcester	2	2	0	50	5	4	0	1	1	5	48
Rhode Island:											
Pawtucket	1	------	0	0	2	3	0	0	0	0	9
Providence	0	------	0	0	1	4	0	2	1	15	48
Connecticut:											
Bridgeport	0	------	0	1	3	2	0	1	1	0	30
Hartford	3	------	0	0	6	0	0	0	2	0	50
New Haven	0	1	0	0	4	1	0	1	0	4	33

City reports for week ended Oct. 14, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
New York.											
Buffalo	2	------	0	0	16	19	0	5	0	17	113
New York	30	13	5	5	88	50	0	84	15	113	1,274
Rochester	5	------	0	0	3	5	0	4	0	4	62
Syracuse	0	------	0	0	3	0	0	2	0	14	32
New Jersey:											
Camden	0	------	0	0	2	4	0	2	0	0	28
Newark	0	5	0	0	3	3	0	2	0	44	83
Trenton	0	------	0	0	3	4	0	2	0	10	23
Pennsylvania:											
Philadelphia	6	5	2	3	14	40	0	28	3	9	418
Pittsburgh	2	2	3	3	18	22	0	8	0	22	131
Reading	0	------	0	0	0	1	0	0	0	5	10
Ohio:											
Cincinnati	5	------	1	2	6	27	0	8	0	4	101
Cleveland	10	37	1	0	6	48	0	11	1	33	150
Columbus	0	------	0	1	3	19	0	4	0	0	70
Toledo	1	------	0	0	5	22	0	2	0	4	65
Indiana:											
Fort Wayne	3	------	0	0	0	4	0	1	0	0	20
Indianapolis	5	------	0	0	7	9	0	3	1	7	--------
South Bend	0	------	0	0	0	7	0	0	0	0	14
Terre Haute	0	------	1	1	1	0	0	0	0	0	20
Illinois											
Chicago	1	3	1	4	29	71	0	33	5	43	570
Springfield	1	------	0	0	0	4	0	1	0	0	19
Michigan.											
Detroit	17	4	2	1	11	36	0	15	1	54	227
Flint	1	------	0	0	3	11	0	0	0	0	26
Grand Rapids	1	------	0	1	0	3	0	1	0	3	22
Wisconsin:											
Kenosha	0	------	0	0	0	7	0	0	0	5	--------
Madison	[1] 2	------	--------	1	------	0	0	1	0	11	22
Milwaukee	2	1	1	0	5	9	0	3	0	46	96
Racine	0	------	0	0	2	5	0	1	0	2	9
Superior	------	------	------	------	------	------	------	------	------	------	--------
Minnesota:											
Duluth	0	------	1	0	1	6	0	3	1	2	22
Minneapolis	6	------	0	1	5	13	0	0	1	12	97
St. Paul	1	1	1	0	2	13	0	2	1	3	59
Iowa:											
Des Moines	2	------	--------	0	------	27	0	------	0	0	25
Sioux City	0	------	--------	0	------	0	0	------	0	5	--------
Waterloo	0	------	--------	0	------	0	0	------	0	0	--------
Missouri:											
Kansas City	9	------	0	1	6	17	0	6	0	2	108
St. Joseph	1	------	0	0	3	3	0	0	0	0	10
St. Louis	17	------	1	2	8	11	0	7	0	7	174
North Dakota:											
Fargo	0	------	0	0	2	0	0	0	1	0	7
South Dakota:											
Aberdeen	0	------	0	0	0	0	0	0	0	0	--------
Nebraska:											
Omaha	1	------	0	3	2	4	0	3	0	1	44
Kansas											
Topeka	0	------	0	0	0	3	0	0	0	0	20
Wichita	1	------	0	0	0	0	0	0	0	3	24
Delaware											
Wilmington	0	------	0	0	4	3	0	0	0	1	27
Maryland											
Baltimore	1	------	0	1	8	16	0	10	3	31	180
Cumberland	2	------	0	2	0	2	0	1	1	0	16
Frederick	0	------	0	0	0	1	0	0	0	0	2
District of Columbia.											
Washington	7	1	1	1	8	14	0	11	4	7	117
Virginia.											
Lynchburg	4	------	0	0	0	2	0	0	0	3	11
Richmond	4	------	0	0	2	3	0	2	1	0	37
Roanoke	11	------	0	0	0	9	0	0	1	0	13
West Virginia.											
Charleston	2	------	0	0	[1] 1	2	0	2	1	0	20
Huntington	5	------	0	0	0	11	0	0	0	0	--------
Wheeling	0	------	0	0	3	5	0	1	2	8	19

[1] Imported.

City reports for week ended Oct. 14, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
North Carolina:											
Raleigh	0	------	0	0	0	4	0	1	1	0	11
Wilmington	3	------	0	0	0	1	0	0	0	0	13
Winston-Salem	7	------	0	0	2	12	0	2	1	0	14
South Carolina:											
Charleston	0	11	0	0	0	2	0	0	0	0	18
Columbia	0	------	0	0	4	0	0	0	0	0	8
Greenville	1	------	0	0	0	0	0	0	0	2	6
Georgia:											
Atlanta	10	9	3	1	2	1	0	4	0	0	77
Brunswick	0	------	0	0	0	0	0	1	0	0	4
Savannah	1	------	0	0	1	1	0	2	0	0	37
Florida:											
Miami	0	------	0	0	0	0	0	4	1	2	20
Tampa	1	------	0	0	1	2	0	0	1	3	30
Kentucky:											
Ashland	4	------	0	0	0	5	0	0	0	10	--------
Lexington	4	3	0	0	0	4	0	1	1	1	14
Louisville	11	------	0	1	5	14	0	1	0	3	81
Tennessee:											
Memphis	6	------	1	0	8	6	0	4	1	0	87
Nashville	3	------	0	0	2	11	0	2	0	1	53
Alabama:											
Birmingham	8	5	1	1	5	6	0	3	6	1	64
Mobile	1	------	0	1	1	1	0	0	0	0	24
Montgomery	1	------	--------	0	-------	2	0	-------	1	0	--------
Arkansas:											
Fort Smith	3	------	--------	0	-------	1	0	-------	0	1	--------
Little Rock	0	------	0	0	0	3	0	3	0	0	4
Louisiana:											
New Orleans	4	1	1	0	6	3	0	13	5	1	--------
Shreveport	12	------	0	0	3	3	0	3	0	0	37
Oklahoma:											
Tulsa	2	------	--------	2	-------	4	0	-------	0	1	--------
Texas:											
Dallas	20	------	0	0	0	3	1	5	1	--------	62
Fort Worth	6	------	0	0	4	7	0	6	0	0	34
Galveston	1	------	0	0	0	1	0	0	1	0	10
Houston	23	------	0	0	2	2	0	1	0	0	48
San Antonio	2	------	1	0	4	0	0	5	0	0	56
Montana:											
Billings	0	------	0	0	0	1	0	0	0	0	4
Great Falls	0	------	0	0	0	0	0	0	0	1	6
Helena	0	------	0	1	0	0	0	0	0	0	4
Missoula	0	------	0	0	0	1	0	0	1	0	1
Idaho:											
Boise	0	------	0	0	1	0	1	0	0	0	11
Colorado:											
Denver	1	16	1	0	2	7	0	4	0	18	87
Pueblo	0	------	0	0	1	1	0	0	0	5	7
New Mexico:											
Albuquerque	0	------	0	0	0	2	0	1	1	0	10
Utah:											
Salt Lake City	0	------	0	5	1	5	0	3	1	2	25
Nevada:											
Reno	0	------	0	0	0	0	0	0	0	0	3
Washington:											
Seattle	0	------	2	0	4	2	0	2	0	6	69
Spokane	0	1	1	4	2	3	0	0	0	0	30
Tacoma	0	------	0	0	5	0	0	1	0	0	31
Oregon:											
Portland	0	------	2	0	2	15	0	0	0	0	62
Salem	0	------	0	0	0	0	0	0	0	0	0
California:											
Los Angeles	11	23	1	4	5	40	1	16	0	37	245
Sacramento	0	------	0	1	1	4	0	3	[1] 1	1	19
San Francisco	1	2	0	0	4	6	0	9	0	17	151

[1] Imported.

City reports for week ended Oct. 14, 1933—Continued

State and city	Meningococcus meningitis		Polio-mye-litis cases	State and city	Meningococcus meningitis		Polio-mye-litis cases
	Cases	Deaths			Cases	Deaths	
Maine:				Wisconsin:			
Portland	0	0	1	Milwaukee	0	0	1
Massachusetts:				Minnesota:			
Boston	0	0	2	Duluth	0	0	1
New York:				Minneapolis	0	0	8
Buffalo	0	0	1	Maryland:			
New York	1	1	13	Baltimore	0	1	0
Syracuse	0	0	1	Virginia:			
New Jersey:				Richmond	0	1	0
Newark	0	0	6	Georgia:			
Pennsylvania:				Atlanta	1	0	2
Philadelphia	1	0	0	Tennessee:			
Pittsburgh	1	0	0	Memphis	1	0	0
Ohio:				Nashville	0	0	1
Cincinnati	0	1	0	Colorado:			
Cleveland	0	0	3	Denver	0	0	1
Indiana:				Washington:			
Indianapolis	2	2	0	Seattle	1	0	2
Illinois:				California:			
Chicago	2	0	5	Los Angeles	2	0	2
Michigan:							
Detroit	1	0	3				

Lethargic encephalitis.—Cases: New York, 3; Pittsburgh, 1; Cleveland, 1; Springfield, Ill., 1; Detroit, 1; Kansas City, Mo., 2; St. Joseph, Mo., 3; St. Louis, 15; Topeka, 2; Wichita, Kans., 2; Louisville, 1; Birmingham, 1; Houston, Tex., 2.

Pellagra.—Cases: Raleigh, 1; Charleston, S.C., 1; Savannah, 1; Birmingham, 1; Montgomery, Ala., 1 Los Angeles, 1.

Typhus fever.—Cases: Atlanta, 4; Savannah, 2; Mobile, 1; San Antonio, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—Two weeks ended October 7, 1933.—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the 2 weeks ended October 7, 1933, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chicken pox		7		48	108	33	22	8	27	253
Diphtheria		2	4	39	14	24	10	1		94
Dysentery					4					4
Erysipelas				4			1	2	4	11
Influenza		10	1	1	8	8			9	37
Lethargic encephalitis					1	2				3
Measles			2	68	10	2		1	21	104
Mumps					24		8		46	78
Paratyphoid fever					9				1	10
Pneumonia					13		4		13	30
Poliomyelitis				10	4	1	1	1		17
Scarlet fever	1	7	13	107	105	38	10	4	48	333
Trachoma									4	4
Tuberculosis		2	21	94	61	12	7	1	35	233
Typhoid fever			23	115	25	11	14	3		191
Undulant fever				1	10					11
Whooping cough		6	6	166	178	54	27	6	29	472

Ontario Province—Communicable diseases—Five weeks ended September 30, 1933.—The Department of Health of the Province of Ontario, Canada, reports certain communicable diseases for the 5 weeks ended September 30, 1933, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	2		Pneumonia		89
Chicken pox	165		Poliomyelitis	7	
Diphtheria	35	2	Scarlet fever	161	1
Dysentery	28	3	Septic sore throat	4	
Erysipelas	3		Syphilis	202	2
German measles	6		Tetanus	1	1
Gonorrhea	237		Trachoma	19	
Influenza	23		Tuberculosis	259	48
Lethargic encephalitis	2	2	Tularaemia	3	
Measles	14		Typhoid fever	91	4
Mumps	85		Undulant fever	34	
Paratyphoid fever	23		Whooping cough	522	3

JAMAICA

Communicable diseases—4 weeks ended October 7, 1933.—During the 4 weeks ended October 7, 1933, cases of certain communicable dis-

eases were reported in Kingston, Jamaica, and in the island of Jamaica, outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis	1	2	Leprosy		5
Chicken pox	2	10	Poliomyelitis		1
Diphtheria	1	1	Puerperal fever		2
Dysentery	6	8	Tuberculosis	17	71
Erysipelas		2	Typhoid fever	11	77

MEXICO

Monterrey—Malaria.—Under date of October 17, 1933, an outbreak of malaria was reported in Monterrey, Mexico, and nearby places. Floods were said to be responsible for the unusual prevalence of the disease.

POLAND

Vital statistics—1932.—The central office of statistics of Poland has published the following provisional vital statistics for 1932:

Number of marriages	270, 277
Marriages per 1,000 inhabitants	8. 3
Number of live births	932, 116
Live births per 1,000 inhabitants	28. 7
Total deaths	487, 125
Deaths per 1,000 inhabitants	15. 0
Infant deaths	133, 351
Deaths of infants per 100 live births	14. 3

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Oct. 27, 1933, pp. 1328-39. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Nov. 24, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

India—Chittagong.—During the week ended October 14, 1933, 1 case of cholera with 1 death was reported in Chittagong, India.

Philippine Islands.—During the week ended October 21, 1933, cholera was reported in the Philippine Islands as follows: Antique Province, Dao, 9 cases, 6 deaths. Bohol Province, Inabanga, 6 cases, 3 deaths. Cebu Province, Carcar, 3 cases, 2 deaths; Cebu city, 3 cases, 1 death; Talisay, 1 case, 1 death; Toledo, 8 cases, 5 deaths.

Typhus Fever

Chile.—A report dated October 11, 1933, states that since January 1, 1933, nearly 5,500 cases of typhus fever had occurred in Chile, of which it is estimated about 90 percent appeared in Santiago.

X

UNITED STATES TREASURY DEPARTMENT

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IN THIS ISSUE

Dissolved Oxygen in the Presence of Certain Wastes
Deaths in Large Cities During Week Ended October 21
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 48 NOVEMBER 10, 1933 NO. 45

EXPERIMENTAL STUDIES OF NATURAL PURIFICATION IN POLLUTED WATERS

VIII. DISSOLVED OXYGEN IN THE PRESENCE OF ORGANIC MATTER, HYPOCHLORITES, AND SULPHITE WASTES[1]

By EMERY J. THERIAULT, *Principal Chemist*, and PAUL D. MCNAMEE, *Junior Chemist, United States Public Health Service*

In general, it appears well established that the Rideal and Stewart method (14), or permanganate modification of Winkler's well-known procedure, for the determination of dissolved oxygen is of value in dealing with waters containing appreciable quantities of nitrites or of ferrous salts. Likewise, a preliminary treatment with permanganate may be desirable in dealing with such forms of organic matter as are commonly present in freshly aerated sewage at ordinary dilutions or in certain varieties of industrial wastes. However, as shown elsewhere (15), the permanganate modification is of doubtful value in dealing with stale sewage. More recently this widely used modification has been shown to fail when applied to samples containing large amounts of either dextrose or peptone. Certain points of interest in connection with this study will be presented in this paper, and a readily applicable procedure will be developed for the determination of dissolved oxygen in the presence of relatively large amounts of organic matter.

There is another type of interference with the Winkler method for which, on closer study, the permanganate treatment has been found to be of little, if any, value—that is, the interference encountered when dissolved oxygen is determined in the presence of sulphite wastes. Notable amounts of organic matter, as much as 10 percent by weight, are present in these wastes together with sulphur compounds. A reasonably effective procedure, based on a preliminary treatment with hypochlorites, will be proposed for the determination of dissolved oxygen in the presence of such wastes.

Finally, attention will be given to the determination of dissolved oxygen in chlorinated samples. The findings in this direction have a direct bearing on studies of chlorination as an adjunct to sewage treatment.

[1] Presented before the Division of Water, Sewage, and Sanitation at the eighty-first meeting of the American Chemical Society, Indianapolis, Ind., Mar. 30 to Apr. 3, 1931, and printed in Industrial & Engineering Chemistry, Analytical Edition, vol. 4, p. 59, Jan. 15, 1932.

INTERFERENCE BY ORGANIC MATTER (GLUCOSE)

Experiments to test the extent of interference with the Winkler method by various forms of organic matter were undertaken, primarily in connection with oxygen-demand studies in which a synthetic mixture containing glucose and peptone was being used. For the purposes of the present discussion these substances may also be regarded as typical of numerous forms of organic matter commonly found in waters polluted by sewage and industrial wastes.

The effect of varying amounts of glucose on the indicated oxygen content of samples containing known amounts of dissolved oxygen is shown in table 1. The experimental solutions were obtained by adding suitable volumes of stock solutions of glucose well below the surface of bottles completely filled with distilled water of known oxygen content. As the concentration of glucose in these stock solutions was relatively high, no correction was applied for the dilution of the dissolved oxygen. The stoppers were then replaced and the mixture was made uniform by inverting the bottles several times. The usual Winkler reagents (2 ml each of manganous sulphate and alkaline-iodide solutions) were then added and the bottles were inverted several times to distribute the precipitate. After the precipitate had settled, the bottles were again inverted several times, and when the upper part of the liquid was clear, 2 ml of concentrated sulphuric acid were added. The test was then completed by titrating a volume of iodine solution equivalent to 200 ml of the original sample.

In another series of bottles to which corresponding amounts of glucose had been added, the tests were started by a preliminary treatment with permanganate, using 0.7 ml of concentrated sulphuric acid and enough 0.2 N potassium permanganate to produce a reddish coloration which was permanent for 5 minutes. The excess of permanganate was then removed by the addition of minimum amounts of oxalate solution. When decolorization was complete, the regular Winkler reagents (1 ml of manganous sulphate solution and 3 ml of alkaline-iodide solution) were added and, after a 5-minute period of contact, the test was completed in the usual manner.

TABLE 1.—*Magnitude of interference due to glucose*

[A, unmodified Winkler procedure; B, permanganate modification]

Procedure	0	10	20	40	80	120	160	200	400	600	1,000	2,000	5,000
	GLUCOSE, P.P.M.												
	INDICATED DISSOLVED OXYGEN CONTENT												
A	8.63	8.55	8.50	8.45	8.41	8.31	8.27	8.20	7.92	7.70	------	------	------
B	8.64	8.57	8.55	8.55	8.43	8.45	8.42	8.30	8.20	8.00	7.90	7.64	7.18

TABLE 1.—*Magnitude of interference due to glucose*—Continued

APPARENT LOSS OF DISSOLVED OXYGEN

A	0.00	0.08	0.13	0.18	0.22	0.32	0.36	0.43	0.71	0.93			
B	0.00	.07	.09	.09	.21	.19	.22	.34	.44	.64	0.74	1.00	1.46

As shown in table 1, the apparent loss of dissolved oxygen is progressively greater with increasing amounts of glucose, irrespective of the procedure used. With the unmodified, or regular, Winkler procedure, the loss of dissolved oxygen reaches 0.93 p.p.m. in the presence of 600 p.p.m. of glucose. Somewhat better results are obtainable with the permanganate modification, although it is clear that this procedure is only partly effective in counteracting the interference.

SOURCE OF INTERFERENCE

Numerous attempts were made to locate the source of the interference. Thus, on the theory that the apparent loss of dissolved oxygen is due to absorption of iodine prior to the titration, the experiment was tried of adding varying amounts of acid for the final acidification. The regular Winkler procedure was used throughout. The results presented in table 2 indicate that the amount of acid used is of little consequence. The behavior of glucose in this respect differs from that of the oxalates (15). These results also indicate that the period of standing after the final acidification and before titration is apparently not a factor.

TABLE 2.—*Effect of increased acidity on interference due to glucose*

Glucose	Sulfuric acid (conc.)	Time of standing after final acidification	Indicated oxygen content	Apparent loss[1]
P.p.m.	*Ml.*	*Min.*	*P.p.m.*	*P.p.m.*
0	1	15	8.56	0.04
0	2	16	8.63	−.03
0	3	17	8.61	−.01
0	4	18	8.60	.00
200	1	5	8.06	.54
200	2	6	8.24	.36
200	3	7	8.21	.39
200	4	8	8.19	.41
200	1	23	8.24	.36
200	2	24	8.27	.33
200	3	25	8.14	.46
200	4	26	8.21	.39

[1] Assuming that the correct oxygen content was 8.60 p.p.m.

In table 3 results are presented which indicate that the apparent loss of dissolved oxygen from samples containing glucose does not depend on the amount of dissolved oxygen present. The dissolved oxygen in these experiments was varied by applying suction to partly

filled carboys. Within the range of values found in natural waters, the apparent loss when the concentration of dissolved oxygen was relatively high was much the same as when water of low oxygen content was used.

TABLE 3.—*Effect of variations in dissolved oxygen content on interference due to glucose*

Concentration of dissolved oxygen	Glucose, P.p.m.		
	0	40	200
INDICATED OXYGEN CONTENT			
High	7.80	7.72	7.46
Medium	6.72	6.57	6.06
Low	2.79	2.69	2.43
APPARENT LOSS			
High	0.00	0.08	0.34
Medium	.00	.15	.66
Low	.00	.10	.36

These preliminary experiments have indicated that interference by glucose probably occurs during the period of alkalinization. Further experiments were therefore made to determine the influence of variations in pH value on the rate of oxidation of glucose. Consideration was also given to the effect of variations in pH value on the rate of absorption of dissolved oxygen by manganous hydroxide.

TABLE 4.—*Results with calcium hydroxide as alkalinizing agent*

Glucose	Indicated oxygen content	Apparent loss of oxygen	Glucose	Indicated oxygen content	Apparent loss of oxygen
P.p.m.	*P.p.m.*	*P.p.m.*	*P.p.m.*	*P.p.m.*	*P.p.m.*
0	7.73	0.00	120	7.60	0.13
10	7.67	.06	160	7.57	.16
20	7.69	.04	200	7.55	.18
40	7.73	.00	400	7.43	.30
80	7.70	.03	600	7.23	.50

In the experiments summarized in table 4 a suspension of calcium hydroxide was used as an alkalinizing agent instead of the customary alkaline-iodide mixture. In this manner the pH value of the alkalinized sample was reduced from the usual figure of 13 or over when the sodium hydroxide-potassium iodide mixture is used to a value of about pH 12. Acidification in the presence of the calcium hydroxide suspension was accomplished with hydrochloric acid, and a solution of potassium iodide was added as a separate reagent.

In comparison with results given in previous tables, it appears that the substitution of calcium hydroxide for sodium (or potassium) hydroxide does lead to somewhat better results when large amounts of glucose are present. The advantage, however, is not marked, and for the results given in table 4 it was secured only by extending the period of alkalinization to fully 8 minutes. With shorter periods of contact, the results obtained were decidedly too low, even in the blanks, indicating that the rate of absorption of dissolved oxygen is greatly affected by any lowering of the pH value. As the decomposition of glucose proceeds at a measurable rate at pH 12, it must be concluded that any beneficial effect of working at this relatively low pH value is counteracted by the prolonged exposure required for the complete absorption of the dissolved oxygen.

TABLE 5.—*Rate of absorption of dissolved oxygen by manganous hydroxide*

PERIOD OF CONTACT WITH $Mn(OH)_2$				
8 min.	1 min.	30 sec.	20 sec.	15 sec.
OBSERVED OXYGEN CONTENT[1]				
P.p.m.	*P.p.m.*	*P.p.m.*	*P.p.m.*	*P.p.m.*
8.15	8.17	8.17	8.15	8.18
8.12	8.15	8.15	8.18	8.17
8.16	8.18	8.18	8.17	8.15
APPARENT LOSS OF OXYGEN[2]				
0.02	0.00	0.00	0.02	−0.01
.05	.02	.02	−.01	0.00
.01	−.01	−.01	0.00	.02

[1] Triplicate determinations.
[2] Basis of average value of 8.17.

RATE OF ABSORPTION OF DISSOLVED OXYGEN

On the basis of these and other experiments it appeared desirable to determine more closely the minimum time required for the complete absorption of dissolved oxygen by manganous hydroxide. In these experiments the medium was ordinary distilled water without addition of glucose. The usual Winkler reagents were used, and the tests were started by the addition of 2 ml of manganous sulphate solution followed by 2 ml of alkaline-iodide reagent. The bottles were then stoppered and the precipitate was agitated, either continuously or at frequent intervals, so that the manganous hydroxide at all times was uniformly distributed throughout the bottle. To secure exact periods of contact, the sulphuric acid required for the final acidification was added before the precipitate had settled and a slight correction, the same in each case, was applied for the loss of the precipitate. Under these conditions the reaction is practically com-

plete in 15 seconds at ordinary temperatures (table 5) when intimate contact between the dissolved oxygen and the manganous hydroxide is maintained through the solution. Up to 8 minutes the exact duration of the period of alkalinization did not appear to be of consequence. It will be noted, however, that organic matter was absent in these experiments.

The technique in these experiments differed from that employed by Theriault (15) in similar experiments where the precipitate was allowed to settle completely each time before repeating the shaking. As the precipitate settles very readily, the actual period of contact with the upper portion of the liquid is uncertain when this procedure is followed, and complete absorption can only be obtained by repeating the shaking.

IMPROVED TECHNIQUE FOR DISSOLVED-OXYGEN TESTS

Attempts were next made to reduce interference due to glucose by diminishing the period of contact with the alkaline-iodide to the minimum consistent with the complete absorption of dissolved oxygen. The effectiveness of this procedure in comparison with tests conducted over periods of alkalinization of 2, 4, and 8 minutes is shown by the results presented in table 6.

TABLE 6.—*Effect of varying periods of alkalinization on interference due to glucose*

Period of alkalinization	Glucose, p.p.m.										
	0	40	60	100	160	200	400	600	1,000	2,000	5,000
	APPARENT LOSS OF DISSOLVED OXYGEN [1]										
8 minutes	0	0.10	0.14	0.14	0.14	0.30	0.58	0.74	1.02	1.52	2.45
4 minutes	0	.04	.07	.04	.15	.18	.34	.54	.62	.86	1.52
2 minutes	0	.00	.07	.04	.08	.06	.14	.24	.40	.51	.92
25 seconds	0	.00	.02	.00	.00	.02	.05	.10	.13	.20	.36
15 seconds	0	.00	.00	.10	.02	.09	.05	.10	.13	.24	.26

[1] Results with 1,000 p.p.m. of glucose or over are averages of triplicate determinations.

When the period of alkalinization was 8 minutes the precipitate was first uniformly distributed throughout the bottle and then allowed to settle completely before mixing for a second time. After a third mixing followed by complete subsidence of the precipitate, the sample was acidified and the liberated iodine was titrated with 0.025 M thiosulphate. A similar procedure was employed when the period of alkalinization was 2 and 4 minutes, except that precipitates were allowed to settle only once and twice, respectively. The precipitate was continuously agitated when the shorter periods of 15 and 25 seconds were used, and the acid was added before the precipitate had

settled appreciably. The preliminary treatment with permanganate was not used.

The results presented in table 6 indicate that, in the presence of glucose and presumably other forms of organic matter, huge errors may be introduced in the Winkler method if the period of alkalinization is prolonged beyond the time strictly necessary for the absorption of the dissolved oxygen. Under the given conditions it seems fair to conclude that reasonably accurate results for dissolved oxygen can be obtained even in the presence of 5,000 p.p.m. of glucose, provided that the period of alkalinization does not exceed 15 to 25 seconds. It would appear, therefore, that the absorption of dissolved oxygen by manganous hydroxide proceeds at a much faster rate than that of the interfering reaction due to the decomposition of glucose at high pH values. The apparent loss of dissolved oxygen when the period of alkalinization is unduly prolonged may be ascribed to the reduction of the manganic hydroxide by the decomposition products of the glucose.

TABLE 7.—*Magnitude of interference due to peptone*

[A, permanganate modification; B, regular Winkler procedure; C, abbreviated technique, 25 seconds' contact; D, abbreviated technique, 15 seconds' contact]

Procedure	Peptone, p.p.m.									
	0	20	40	80	120	160	200	400	600	1,000
	APPARENT LOSS OF OXYGEN									
A	0	0.20	0.27	0.44	0.57	0.94	1.41	....	2.12	2.85
B	0	.10	.05	.11	.15	.19	.32	0.62	.74	1.43
C [1]	0	.02	0	.03	.07	.12	.11	.22	.34	.40
D	0	0	.01	.03	.04	.10	.08	.21	.23	.40

[1] Average values in triplicate determinations. Other results are representative series of single observations.

It is to be noted that the rate of absorption of dissolved oxygen by manganous hydroxide depends not only on the pH value at which the reaction occurs but also on the amount of manganous hydroxide present in suspension. It can readily be shown that the period of alkalinization should be approximately doubled when 1 ml each of the Winkler reagents is used instead of 2-ml portions as in the above experiments. A longer period of contact with manganous hydroxide must also be allowed when phosphates, carbonates, and other buffering materials are present in large amounts. Clark (5) recommends a period of alkalinization of at least 10 minutes when dissolved oxygen is determined in samples of sea water. With river waters and with ordinary domestic sewage, a period of contact of 20 to 25 seconds appears to be sufficient when 2-ml portions of the Winkler reagents are added to 300-ml samples.

INTERFERENCE BY PEPTONE

As shown in table 7, the simple expedient of abbreviating the period of alkalinization is also effective in reducing interference due to peptone. Using the regular Winkler procedure (2 ml each of the reagents) and allowing the precipitate to settle twice, the apparent loss of dissolved oxygen was 0.74 p.p.m. when 600 p.p.m. of peptone (Difco) were present. The period of alkalinization in this experiment was about 3 minutes. Using the modified technique (25 seconds' contact), this loss was reduced to 0.34 p.p.m. The corresponding loss with the permanganate modification was 2.12 p.p.m. With large amounts of peptone, the proposed technique is not so effective as with corresponding amounts of glucose. The improvement over the usual procedures is nevertheless marked.

As pointed out by Cooper, Cooper, and Heward (6) in work with peptone solutions, and as further shown by Theriault (15) for stale sewage, the results obtained with the permanganate modification are progressively lower as the period of contact with the permanganate solution is increased, the indication being that dissolved oxygen may be absorbed by peptone and by stale sewage even in the presence of permanganate. In the experiments presented in table 7, this "immediate" demand effect was partly obviated by aerating the stock peptone solution prior to the test. Huge losses may be observed with freshly prepared peptone solutions and with stale sewage irrespective of the procedure used. For the purposes of oxygen-demand tests, the dissolved-oxygen content calculated from the known value for the dilution water may be more nearly correct than the value found by direct analysis. The error in question disappears when the samples are incubated under aerobic conditions for 24 hours or longer.

Apart from its usefulness in work with dilute solutions of dextrose or of peptone, the procedure of reducing the period of alkalinization to a minimum has been found very effective in dealing with concentrated sewage mixtures and sludge liquors. The extension of this technique to such other forms of organic matter as may be encountered in various industrial wastes calls for special study of the individual waste. In dealing with sulphite wastes, for example, this modified or abbreviated technique appears very effective in repressing the deleterious effect of the organic matters present. It is of no value, however, in obviating interference due to the inorganic constituents (sulphites, polythionates, etc.) of such wastes.

INTERFERENCE BY SULPHITE WASTES

A critical study of methods for the determination of dissolved oxygen in the presence of sulphite wastes was undertaken in this laboratory in April 1930 at the request of the State Department of

Health of Maine, in preparation for a cooperative study of stream conditions. A report covering this survey has been published by a committee of paper manufacturers (Joseph A. Warren, chairman, Cumberland Mills, Maine) and the State health department (C. F. Kendall, commissioner, and E. W. Campbell, sanitary engineer) with the collaboration of C. L. Walker, Cornell University, and C. M. Baker, representing the American Pulp and Paper Association. Various modifications of the Winkler method were applied to samples of digester wastes furnished through the courtesy of representative paper manufacturers. The results obtained are of interest in the elucidation of the mechanism of the interference. For this reason they will be briefly discussed before presenting the new modification which finally proved to be reasonably effective.

RIDEAL-STEWART MODIFICATION (PERMANGANATE)

Warrick (State Department of Health of Wisconsin; private communication) had previously indicated that the permanganate or Rideal-Stewart modification of the Winkler method is of doubtful value in counteracting interference due to sulphite wastes. Haase (8) has claimed that the permanganate treatment is useless with these wastes, and in a later publication (9) he has proposed an empirically calibrated electrochemical procedure for the determination of dissolved oxygen in the presence of sulphites.

Bach (2) has confirmed the findings of Haase in regard to the deficiencies of the permanganate procedure and has shown that sodium sulphite may be present in amounts up to 1,000 p.p.m. when the Miller (ferrous ammonium tartrate and safranin) procedure is used, provided that alcohol, at the rate of 10 ml of 95 percent ethyl alcohol per liter, is added as a preliminary treatment.

There is ample evidence in the literature (10) that the oxidation of sulphites by permanganates and also by bromates does not proceed to completion. It appears probable that dithionic acid is formed along with sulphate, so that only 90 to 95 percent of the total sulphite is actually oxidized to sulphate. It is not surprising, therefore, that the Rideal-Stewart (permanganate) modification should prove inadequate in the presence of relatively large amounts of sulphite wastes.

Experiments with the permanganate modification indicate that, in water containing 8 or 9 p.p.m. of dissolved oxygen, the results obtained after adding 1 volume of digester waste to 1,000 volumes of water may be 3 or 4 p.p.m. too low. The total absence of dissolved oxygen may be indicated at dilutions of 1 to 300. As shown by direct observations on the rate of absorption of dissolved oxygen by sulphite wastes, this loss is only apparent. It is not difficult, for instance, to produce a laboratory condition where fish are swimming

freely in a water apparently devoid of dissolved oxygen on the basis of the permanganate modification.

ALSTERBERG MODIFICATION (BROMINE)

The Alsterberg (1) modification, based on a preliminary treatment with bromine with subsequent removal of the excess of reagent by salicylic acid, gave somewhat better results than the permanganate treatment. At best, however, the errors were still too great to make this modification of any value for the purpose at hand. The period of contact with the bromine was only 2 minutes in these experiments. A 24-hour period of contact, as recommended by Alsterberg, is impractical with sulphite wastes.

NOLL MODIFICATION (IODINE)

The preliminary oxidation of interfering substances has been accomplished by Noll (13) through the use of iodide in the presence of manganic salts. A solution of iodine is recommended by Lunge (11) and by Winkler (18) when organic matter is present. It is now well known that the oxidation of sulphites by iodine proceeds to completion with the formation of sulphates. This modification, therefore, appeared promising in dealing with sulphite wastes.

In applying the iodine modification a solution of potassium biniodate was first added to 300-ml sample bottles filled with distilled water to which graded amounts of a freshly prepared stock solution of sodium sulphite had also been added. Iodine was then released by acidification in the presence of an iodide. After standing for a few minutes, 0.2 ml of starch solution was added to serve as an indicator and the excess of iodine was removed by the addition of thiosulphate solution, thereby forming tetrathionates. Dissolved oxygen was then determined by the regular Winkler procedure, starting with the addition of 2-ml portions of manganous sulphate and of alkaline-iodide solutions. Starch solution, in the amount added, does not interfere with the Winkler method.

It was noted that the brown precipitate of manganic hydroxide which first forms became rapidly lighter in color on standing. The results for dissolved oxygen were decidedly low, the error increasing somewhat in proportion to the amount of thiosulphate used in the preliminary treatment. Chapin (4) has clearly shown that "tetrathionates are notably sensitive to even low concentrations of hydroxyl ions, although only slightly affected by sodium bicarbonate." The decomposition leads to the formation of sulphites and thiosulphates by which the manganic hydroxide can be reduced to the manganous condition (12). With particular reference to the determination of arsenic, but with equal application to the present problem, Chapin (4) recommends that "as a discharging agent for iodine * * * it

seems safer to abandon the use of thiosulphate altogether, and to substitute therefor a dilute solution of sodium sulphite."

Avoiding the use of thiosulphate for the removal of iodine, the preliminary oxidation of sulphites was next accomplished by the cautious addition of an iodine solution to an end point, again using starch as an inside indicator. In other experiments a definite excess of iodine was added and the decolorization was accomplished with a dilute solution of sodium sulphite. Accurate results were obtained in either case with sulphites present to the extent of 2.0 to 12.0 ml of 0.025 M sodium sulphite in 300 ml of distilled water. The loss of dissolved oxygen from dilute sulphite solutions was negligibly small over the short period of standing required in these experiments. In time, however, a gradual deoxygenation is readily shown.

The observation that the use of thiosulphates for the removal of iodine prior to the addition of the Winkler reagents is unsound has an obvious bearing on studies of the chlorination or superchlorination of sewage, industrial wastes, and grossly polluted waters. The usual procedure has been to discharge the excess of chlorine by the addition of an iodide. The liberated iodine is then removed with thiosulphate. The dechlorinated sample may then be used for dissolved-oxygen or oxygen-demand tests. In cases where an excess of iodine is necessarily present it is obviously advisable to substitute sulphites for thiosulphates in the removal of free iodine, thereby forming stable sulphates instead of the readily decomposable tetrathionates.

Although a preliminary treatment with iodine is very efficacious in obviating interference due to sulphites, this procedure was found to be of little value in dealing with sulphite wastes. The indications are that sulphites, as such, are of minor significance in these waste liquors. Other modifications of the Winkler method were therefore examined.

MANGANOUS CARBONATE MODIFICATION

Winkler (18) has proposed an ingenious modification of his original procedure for dissolved oxygen for use in the presence of nitrites and organic matter. The test is conducted in the usual manner up to the removal of dissolved oxygen by the formation of manganous hydroxide, except that the alkalinizing solution need not contain any iodide. The excess of manganous hydroxide is then converted to carbonate by leading in carbon dioxide or by the addition of solid sodium acid carbonate (3). As the carbonate does not absorb oxygen from air, interfering substances are then removed by filtration and the test is completed on the precipitate itself.

In blank experiments using sodium acid carbonate it was found that high results were obtained when the hydrogen-ion concentration corresponded to pH 10 or thereabouts. The best results were obtained

by adjustment of solution in the range of pH 7 to 8 with phosphoric acid. At still lower pH values, low results were obtained owing to the loss of precipitate by resolution.

In work with pure sulphite solutions low results were invariably obtained, irrespective of pH adjustments. As already shown, this loss is due to the reduction of the manganic hydroxide by the sulphite, so that the subsequent filtration is purposeless.

Applied to sulphite wastes, the method gave somewhat better results than previously described procedures. At best, however, the errors were still much too great to warrant the extension of this modification to the paper-mill wastes.

MANGANIC CHLORIDE MODIFICATION

The reduction of the manganic hydroxide formed in the course of the dissolved-oxygen test suggests the possibility of counteracting this interference by a preliminary treatment with manganic salts, as originally proposed by Winkler (17). A precipitate of manganous hydroxide was accordingly oxidized by air, and, after acidification, the resulting suspension was used as an oxidizing agent. The excess of manganic salt was reduced by adding potassium iodide, and the liberated iodine was in turn removed with sodium sulphite. The results obtained in this double treatment with manganic salts and iodine were unsatisfactory and the procedure was abandoned.

ACID HYPOCHLORITE MODIFICATION

Winkler (19) has proposed a fourth modification of his original procedure for the determination of dissolved oxygen, based on a preliminary treatment of samples containing readily oxidizable substances with calcium hypochlorite in acid solution. The excess of reagent is removed with potassium thiocyanate and a correction is applied by running a blank.

This method and a later revision (20) proved impractical in work with sulphite wastes owing to the difficulty of obtaining accurate values for the blanks. The results obtained were nevertheless encouraging.

ALKALINE-HYPOCHLORITE MODIFICATION

On the basis of the foregoing experiments and in accord with the work of Foerster et al. (7) on the equilibrium between sulphurous acid and its salts in aqueous solution, the conclusion seems warranted that the interference of sulphite wastes with the Winkler method is only partly due to sulphites as such. As shown by direct titration with iodine solutions, the amount of sulphite present in these wastes is relatively small. The iodine-consuming capacity of these wastes may be increased thirtyfold, however, upon treatment with hydroxides.

It is probably due to the readily decomposable polythionates and to similar organic sulphur compounds that interference due to sulphite wastes is to be ascribed. Under the highly alkaline conditions of the Winkler procedure it is to be expected that these sulphur compounds would break down to form sulphites and thiosulphates. It is obvious that interference would then occur either by reduction of manganic hydroxide or by removal of iodine, as in the final step of the Winkler process.

A preliminary treatment of the sulphite wastes with alkalies, followed by a treatment with iodine in acid solution, does not remedy the situation, as the oxidation of the thiosulphates and trithionates only proceeds to the formation of tetrathionates which are later broken down during the subsequent period of alkalinization.

Now it is known that the oxidation of thiosulphates and the higher polythionates does proceed to completion under the action of chlorine. The method finally adopted, therefore, for the determination of dissolved oxygen in the presence of sulphite wastes consists in a preliminary treatment of the sample with a highly alkaline solution of a hypochlorite. As these conditions are also favorable to the reaction of dissolved oxygen with organic matter and with inorganic sulphur compounds, this preliminary treatment must necessarily be brief. The subsequent treatment calls for the removal of the undecomposed hypochlorite. This is accomplished by acidifying the sample in the presence of an iodide, which is in turn removed with a dilute solution of sodium sulphite. Dissolved oxygen may then be determined in a solution supposedly freed from sulphites, thiosulphates, and the polythionates, although notable amounts of relatively stable forms of organic matter are still present. The technique developed in the first part of this paper for use in the presence of such forms of organic matter as glucose also appears to be reasonably effective in dealing with the organic components of sulphite wastes.

The reader is referred to Supplement No. 90 to the PUBLIC HEALTH REPORTS (16) for detailed instructions regarding the performance of the dissolved-oxygen test in the presence of various interfering substances. For sulphite wastes the recommended procedure is substantially as follows:

1. Add enough alkaline-hypochlorite reagent (1 M sodium hypochlorite in 0.1 M sodium hydroxide) to oxidize the sample, avoiding a great excess.

With river water polluted with sulphite wastes, 0.2 ml of the alkaline-hypo chlorite reagent may be added as a trial amount. In oxygen-demand work, add 1 ml of alkaline-hypochlorite reagent for each milliliter of digester waste present in the bottle under examination.

The alkaline-hypochlorite reagent may be prepared by passing chlorine gas through 2.1 M sodium hydroxide, with cooling, until a 1-ml test portion of the chlorinated solution requires about 20 ml of 0.10 M thiosulphate for the neutralization of the iodine released upon acidification in the presence of an iodide. This reagent should give more than a fleeting color with phenolphthalein.

2. Mix well by inverting rapidly a few times. The duration of this treatment should not greatly exceed 20 seconds.

3. Acidify the sample by adding 1 ml of dilute sulphuric acid (10 percent solution) and add 1 ml of 1 M potassium (or sodium) iodide to release iodine. Shake.

4. Neutralize the liberated iodine with 0.1 or 0.025 M sodium sulphite, using 0.2 ml of starch solution as an inside indicator. If the end point is greatly overstepped, it may be restored with 0.1-ml portions of 0.1 or 0.025 M potassium biniodate or iodate.

The reaction between sulphites and iodine to form sulphates is complete, under the given conditions, only in very dilute solution. Relatively low results will be obtained when more than 3 ml of 0.05 M (0.1 N) sulphite are required for the neutralization of the iodine. On the other hand, if only 0.1 ml or thereabouts of 0.05 M sulphite is required, it may be assumed that an insufficient amount of alkaline-hypochlorite has been used.

5. Add 1 ml of the usual manganous sulphate solution and 1.3 ml of alkaline-iodine solution. A slight excess (0.3 ml) of the alkaline-iodine solution is used in order to neutralize the acid added during the preliminary treatment. The period of contact with the manganous hydroxide should not exceed 40 to 50 seconds.

6. The titration should not be delayed, as a measurable loss of iodine occurs on standing.

Comparative results with the permanganate modification (A), with the unmodified Winkler procedure (B), and with the alkaline-hypochlorite modification (C) are given in table 8. Satisfactory results are obtained by all three procedures when the concentration of digester waste does not exceed 1 part in 30,000 of water. The results with the permanganate modification are decidedly low at dilutions of 1 to 10,000, and the complete absence of dissolved oxygen may be indicated by this procedure at dilutions of 1 to 300.

On the whole, the unmodified, or regular Winkler, method gives better results with sulphite wastes than the permanganate modification. Huge errors, nevertheless, are introduced at dilutions of 1 to 3000 or less.

The alkaline-hypochlorite modification gives reasonably accurate results even in the presence of 1 part of digester waste in 300 parts of sample, corresponding to the situation which might be encountered at sampling points in the immediate vicinity of a paper mill. At dilutions of 1 to 150, however, this method also shows signs of failure.

TABLE 8.—*Magnitude of interference due to sulphite wastes*

[A, permanganate modification; B, regular Winkler procedure; C, alkaline-hypochlorite modification]

Method	Dilution of digester waste, p.p.m.												
	1 to 300,000	1 to 150,000	1 to 60,000	1 to 30,000	1 to 15,000	1 to 10,000	1 to 6,000	1 to 3,000	1 to 1,500	1 to 1,000	1 to 600	1 to 300	1 to 150
	Apparent loss of oxygen[1]												
A	−0.06	0.00	−0.06	0.12	0.34	0.45	0.77	1.68	2.78	3.58	5.67	[2]8.27	------
B	.03	.07	.10	.15	.02	.30	.24	.54	1.17	1.74	2.63	4.59	7.22
C	0.00	.05	.02	0.00	.04	.07	.06	−.06	.10	.16	.20	.30	1.10

[1] Average values in triplicate determinations.
[2] Corresponding to the total absence of dissolved oxygen.

It will be noted that the values given in table 8 refer to the apparent loss of dissolved oxygen and not to the dissolved-oxygen content. The actual dissolved-oxygen content in all cases was in the neighborhood of 8.5 p.p.m. prior to the addition of digester waste. The possibility exists that, under rigid conditions of test, these apparent losses with different procedures might serve as an index to the amount of waste present in a sample of river water. A less cumbersome and more sensitive test might be devised on the basis of the increase in iodine-consuming capacity of a sample following a treatment with hydroxides.

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COURT DECISION RELATING TO PUBLIC HEALTH

Certified copy of birth certificate held admissible in evidence.—(Missouri Supreme Court, Division No. 2; *State* v. *Worden*, 56 S.W. (2d) 595; decided Dec. 14, 1932.) In a criminal case the State introduced in evidence a certified copy of the birth certificate of the prosecuting witness. By section 9052, Revised Statutes 1929, a certificate of birth was required to be filed by the attending physician, and, by section 9060, a certified copy of a certificate was admissible in evidence. On appeal, the introduction of the certified copy was assigned as error, the complaint being that the portion of the law providing for certified copies as evidence was contrary to the State constitution in that the title of the act had no reference to the issuance of certified

copies. In holding the certified copy admissible, the supreme court said:

Since original certificates of that character [birth certificates] are required by the statute, section 9058, R.S. 1929 (Mo. St. Ann., sec. 9058), to be permanently kept, such a certificate becomes an official record which is always admissible in evidence. A copy of a public paper required to be filed, certified by the officer intrusted with its custody, is admissible in evidence if the original is admissible. [Cases cited.] A certified copy was admissible without the authority of section 9060 (Mo. St. Ann., sec. 9060).

DEATHS DURING WEEK ENDED OCTOBER 21, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Oct. 21, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	7,647	7,348
Deaths per 1,000 population, annual basis	10.7	10.5
Deaths under 1 year of age	531	561
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	46	47
Deaths per 1,000 population, annual basis, first 42 weeks of year	10.8	11.1
Data from industrial insurance companies:		
Policies in force	67,550,341	70,173,439
Number of death claims	13,202	12,741
Death claims per 1,000 policies in force, annual rate	10.2	9.5
Death claims per 1,000 policies, first 42 weeks of year, annual rate	9.8	9.6

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended October 28, 1933, and October 29, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Oct. 28, 1933, and Oct. 29, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Oct. 28, 1933	Week ended Oct. 29, 1932	Week ended Oct. 28, 1933	Week ended Oct. 29, 1932	Week ended Oct. 28, 1933	Week ended Oct. 29, 1932	Week ended Oct. 28, 1933	Week ended Oct. 29, 1932
New England States:								
Maine	2	1	18		1		0	0
New Hampshire					1		0	0
Vermont	1				2	1	0	0
Massachusetts	19	34		2	68	40	0	0
Rhode Island	1	7				1	0	0
Connecticut		5	3	2	5	10	1	2
Middle Atlantic States:								
New York	45	25	[1] 15	[1] 14	170	96	1	6
New Jersey	20	26	9	12	16	93	0	2
Pennsylvania	88	118			8	193	4	2
East North Central States:								
Ohio [2]	124	122	83	94	14	101	0	1
Indiana	66	101	49	55	11	10	0	5
Illinois	41	112	13	17	19	30	4	7
Michigan	22	26	3	5	11	104	1	3
Wisconsin	13	13	34	26	51	123	0	1
West North Central States:								
Minnesota	11	21	1	3	11	102	0	1
Iowa [4]	25	25			2	3	1	2
Missouri	109	92	1	2	3	8	1	1
North Dakota	11	1			1	67	0	0
South Dakota	5	1			20		0	0
Nebraska	6	40			3	5	0	0
Kansas	21	26		3	7	8	0	1
South Atlantic States:								
Delaware	2	4				1	0	0
Maryland [2]	29	22	6	2	3	3	1	2
District of Columbia	12	2	1	1	2		0	0
Virginia [2]	141	61			6	58	0	0
West Virginia	121	69	36	7	6	10	2	1
North Caroline [2,4]	195	106	15	7	75	60	1	1
South Carolina [2]	40	34	270	393	26	1	0	0
Georgia [2]	67	56			30	1	1	0
Florida [2]	9	18	3	4	2	1	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Oct. 28, 1933, and Oct. 29, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Oct 28, 1933	Week ended Oct 29, 1932	Week ended Oct. 28, 1933	Week ended Oct. 29, 1932	Week ended Oct 28, 1933	Week ended Oct 29, 1932	Week ended Oct. 28, 1933	Week ended Oct 29, 1932
East South Central States:								
Kentucky	140	82	38	36		44	0	1
Tennessee	73	95	78	25	73	1	2	1
Alabama [2]	95	94	79	28	9	2	1	1
Mississippi [2]	36	51					0	0
West South Central States.								
Arkansas	52	23	24	37	18	4	0	0
Louisiana	47	29	5	17	1	4	1	2
Oklahoma [5]	79	86	58	25	10	1	0	0
Texas [2]	275	185	104	46	10		0	0
Mountain States:								
Montana	2		4	14		85	0	1
Idaho		8				1	0	0
Wyoming				1	1	1	0	0
Colorado	11	6			3	1	0	0
New Mexico	12	10		27	15		0	0
Arizona	3	4	3	40		1	0	0
Utah [3]					51	2	1	1
Pacific States:								
Washington	6				12	5	1	0
Oregon [4]	2		25	36	23	23	0	0
California	50	59	18	214	193	40	2	4
Total	2,129	1,900	976	1,195	993	1,345	26	49

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Oct. 28, 1933	Week ended Oct. 29, 1932	Week ended Oct. 28, 1933	Week ended Oct. 29, 1932	Week ended Oct. 28, 1933	Week ended Oct. 29, 1932	Week ended Oct. 28, 1933	Week ended Oct. 29, 1932
New England States.								
Maine	4	3	4	27	0	0	9	2
New Hampshire	1	0	16	26	0	0	2	0
Vermont	2	0	6	11	0	0	1	0
Massachusetts	2	1	121	181	0	0	6	14
Rhode Island	1	0	7	20	0	0	1	0
Connecticut	1	2	39	26	0	0	1	0
Middle Atlantic States:								
New York	29	7	244	238	0	1	13	22
New Jersey	5	8	84	119	0	0	9	7
Pennsylvania	10	32	348	402	0	0	31	55
East North Central States:								
Ohio [1]	21	1	397	436	9	19	19	26
Indiana	1	1	172	117	2	1	15	6
Illinois	5	6	278	284	0	4	12	19
Michigan	4	1	217	218	0	0	22	6
Wisconsin	1	3	98	59	18	1	2	1
West North Central States:								
Minnesota	11	3	38	51	4	0	3	9
Iowa [1]	1	0	70	47	0	2	2	2
Missouri	1	1	124	87	5	0	5	20
North Dakota	4	0	19	2	0	0	2	0
South Dakota	1	0	13	30	0	0	3	2
Nebraska	3	4	34	61	1	3	4	1
Kansas	2	1	119	93	0	1	5	7
South Atlantic States:								
Delaware	0	1	5	7	0	0	1	1
Maryland [3]	2	0	86	79	0	0	14	30
District of Columbia	0	1	9	17	0	0	2	1
Virginia [3]	2	3	143	96	0	0	28	20
West Virginia	5	0	160	77	0	0	32	25
North Carolina [2] [4]	1	1	171	111	0	0	15	17
South Carolina [3]	0	0	28	9	0	1	13	22
Georgia [3]	0	1	33	45	0	0	11	21
Florida [3]	0	0	6	7	0	0	1	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Oct. 28, 1933, and Oct. 29, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Oct. 28, 1933	Week ended Oct. 29, 1932	Week ended Oct. 28, 1933	Week ended Oct. 29, 1932	Week ended Oct. 28, 1933	Week ended Oct. 29, 1932	Week ended Oct. 28, 1933	Week ended Oct. 29, 1932
East South Central States:								
Kentucky	0	3	144	88	1	1	39	43
Tennessee	2	4	161	90	2	0	30	24
Alabama [2]	1	1	55	56	0	0	16	5
Mississippi [3]	0	0	31	45	0	0	9	4
West South Central States:								
Arkansas	0	3	33	17	0	0	11	9
Louisiana	0	0	24	18	1	1	27	6
Oklahoma [5]	0	2	26	50	1	0	27	28
Texas [2]	1	2	91	80	4	1	54	23
Mountain States:								
Montana	0	0	5	16	0	0	2	2
Idaho	0	1	4	3	2	2	0	3
Wyoming	0	0	5	18	0	0	0	0
Colorado	0	1	34	33	5	1	9	3
New Mexico	0	0	26	14	1	0	33	17
Arizona	0	0	12	15	0	0	3	4
Utah [3]	0	0	1		0	0	0	1
Pacific States:								
Washington	3	1	37	27	1	5	2	5
Oregon [4]	1	1	38	12	3	2	4	3
California	5	4	171	115	10	5	13	7
Total	133	104	3,990	3,680	70	51	563	523

1 New York City only.
2 Typhus fever, week ended Oct. 28, 1933, 55 cases, as follows: Ohio, 9; Virginia, 2; North Carolina, 2; South Carolina, 1; Georgia, 17; Florida, 2; Alabama, 17; Texas, 5.
3 Week ended earlier than Saturday.
4 Rocky Mountain spotted fever, week ended Oct. 28, 1933, 2 cases, as follows: North Carolina, 1; Oregon, 1.
5 Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
September 1933										
Alabama	3	326	84	1,320	53	99	6	187	1	98
California	8	116	95	6	322	2	17	408	29	46
Kansas	1	40	8	3	27		12	251	2	38
Mississippi		116	627	18,339	164	469	2	58	2	52
Oklahoma [1]	5	234	92	423	41	13	12	66	3	192
Oregon	1	20	51	9			7	48	4	24
Texas	6	498	562	2,557		47	7	177		296
Virginia	7	300	277	58	53	9	10	320	0	142
Washington	2	20	20		112		27	59	11	25

1 Exclusive of Oklahoma City and Tulsa.

September 1933

Disease and State	Cases
Actinomycosis:	
California	2
Anthrax:	
Kansas	1
Virginia	1
Botulism	
California	1
Chicken pox:	
Alabama	3
California	347
Kansas	34
Mississippi	111
Oklahoma [1]	4
Oregon	26
Virginia	29
Washington	127
Diarrhea and dysentery:	
Virginia	335
Dysentery:	
California (amebic)	7
California (bacillary)	24
Mississippi (amebic)	44
Oklahoma [1]	90
Oregon	2
Food poisoning:	
California	42
German measles:	
California	32
Kansas	3
Washington	15
Hookworm disease:	
Mississippi	873
Impetigo contagiosa:	
Kansas	17
Oklahoma	2
Oregon	115
Washington	1
Leprosy:	
California	1
Lethargic encephalitis:	
Alabama	5
California	6
Kansas	75
Mississippi	1
Oklahoma [1]	13
Oregon	2
Texas	25
Virginia	6
Washington	6
Mumps:	
Alabama	23
California	549
Kansas	57
Mississippi	39
Oklahoma [1]	11
Oregon	8
Virginia	13
Washington	60
Ophthalmia neonatorum:	
California	1
Oklahoma [1]	1
Virginia	3
Paratyphoid fever:	
California	3
Kansas	3
Oregon	3
Texas	10
Virginia	7
Washington	1
Puerperal septicemia:	
Mississippi	22
Washington	2
Rabies in animals:	
California	56
Mississippi	3
Washington	6
Relapsing fever:	
California	2
Rocky Mountain spotted fever:	
California	1
Virginia	2
Scabies:	
Kansas	18
Oklahoma [1]	4
Oregon	65
Washington	11
Septic sore throat:	
California	4
Kansas	4
Oklahoma [1]	42
Oregon	1
Virginia	9
Tetanus:	
California	5
Kansas	3
Oklahoma [1]	2
Trachoma:	
California	20
Kansas	1
Mississippi	14
Oklahoma [1]	8
Trench mouth:	
Oklahoma [1]	2
Oregon	6
Trichinosis:	
California	4
Tularaemia:	
Virginia	3
Typhus fever:	
Alabama	143
Undulant fever:	
California	12
Kansas	8
Oklahoma [1]	4
Oregon	6
Virginia	6
Washington	1
Vincent's angina:	
Kansas	6
Oregon	10
Whooping cough:	
Alabama	92
California	816
Kansas	183
Mississippi	534
Oklahoma [1]	34
Oregon	33
Virginia	143
Washington	79

LETHARGIC ENCEPHALITIS, ST. LOUIS, MO.

From July 1 to November 3, 1933, 561 cases of lethargic encephalitis were reported in the city of St. Louis, Mo., with 124 deaths. In the county of St. Louis during this period there were 501 cases of lethargic encephalitis with 89 deaths.

WEEKLY REPORTS FROM CITIES

City reports for week ended Oct. 21, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0	------	0	0	1	0	0	0	0	8	28
New Hampshire:											
Concord	0	------	0	0	0	0	0	0	0	0	8
Manchester	0	------	0	0	0	0	0	1	0	0	16
Nashua	0	------	0	0	0	17	0	0	1	0	1
Vermont											
Barre	0	------	0	0	0	0	0	0	0	0	4
Burlington	0	------	0	0	0	1	0	0	0	0	4
Massachusetts											
Boston	5	------	1	19	20	36	0	7	1	38	188
Fall River	0	------	0	0	1	1	0	1	0	1	26
Springfield	0	------	0	1	0	1	0	1	0	10	33
Worcester	0	------	0	23	3	0	0	1	0	18	43
Rhode Island:											
Pawtucket	0	------	0	0	0	1	0	0	0	0	16
Providence	0	------	0	0	2	8	0	1	0	36	42

[1] Exclusive of Oklahoma City and Tulsa.

City reports for week ended Oct. 21, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Connecticut:											
Bridgeport	0	2	2	1	3	8	0	1	0	0	40
Hartford	0		0	0	2	2	0	0	0	0	36
New Haven	0	2	0	0	2	2	0	0	0	4	42
New York:											
Buffalo	3		0	3	20	15	0	4	0	27	124
New York	37	10	3	12	129	62	0	75	18	129	1,362
Rochester	0		1	0	3	0	0	2	0	7	59
Syracuse	0		0	0	1	0	0	0	0	13	37
New Jersey:											
Camden	1		0	0	0	5	0	1	0	0	24
Newark	0	3	0	2	6	10	0	8	0	36	100
Trenton	0	2	0	0	1	7	0	3	0	2	40
Pennsylvania:											
Philadelphia	4	1	0	15	23	42	0	17	1	38	448
Pittsburgh	8	3	1	1	21	12	0	6	1	10	149
Reading	0		0	1	1	0	0	1	0	11	23
Ohio:											
Cincinnati	11		0	1	12	22	0	5	0	7	128
Cleveland	19	35	0	0	11	43	0	13	2	27	182
Columbus	1	1	1	0	3	18	0	4	1	2	82
Toledo	3		0	0	5	16	0	1	0	3	76
Indiana:											
Fort Wayne	4		0	0	5	1	0	0	0	0	28
Indianapolis	0		0	0	5	9	0	5	1	3	
South Bend	0		0	0	0	11	0	1	0	1	17
Terra Haute	0		0	0	1	0	0	2	0	0	15
Illinois:											
Chicago	0	2	1	5	30	84	0	33	0	45	709
Springfield	0		0	0	2	3	0	0	0	0	25
Michigan:											
Detroit	13	3	2	5	11	46	0	18	1	85	188
Flint	3		0	0	1	21	0	4	0	4	24
Grand Rapids	0		0	0	1	7	0	0	0	0	18
Wisconsin:											
Kenosha	0		0	0	0	1	0	0	0	5	9
Madison	0			0		1	0		0	23	27
Milwaukee	3		0	5	5	7	0	4	1	61	94
Racine	0		0	0	0	7	0	0	0	4	7
Superior	0		0	0	0	2	0	0	0	2	7
Minnesota:											
Duluth	0		0	0	5	4	0	1	1	0	24
Minneapolis	7		0	1	3	11	0	1	0	14	111
St. Paul	0		0	0	3	9	0	0	0	4	55
Iowa:											
Des Moines	5			0		13	0		0	0	32
Sioux City	2			1		0	0		0	2	
Waterloo	1			0		0	0		0	0	
Missouri:											
Kansas City	1		0	1	7	10	0	4	5	2	82
St. Joseph	2		0	0	1	3	0	0	0	0	21
St. Louis	17		1	2	2	16	0	10	0	9	174
North Dakota:											
Fargo	0		0	0	0	0	0	0	0	0	0
Grand Forks	0		0	0	0	0	0	0	0	0	0
South Dakota:											
Aberdeen	0		0	1	0	0	0	0	2	0	0
Nebraska:											
Omaha	4		0	1	5	6	0	2	0	6	47
Kansas:											
Topeka	0		0	0	0	2	0	0	0	2	15
Wichita	1		0	0	1	13	0	3	0	1	28
Delaware:											
Wilmington	1		0	1	4	0	0	0	1	0	48
Maryland:											
Baltimore	7	5	1	0	20	22	0	11	4	23	199
Cumberland	1		0	0	0	9	0	1	0	2	11
Frederick	0		0	0	0	3	0	0	0	0	3
District of Col.:											
Washington	8	1	1	1	5	10	0	14	5	3	139
Virginia:											
Lynchburg	7		0	0	0	3	0	1	0	7	5
Richmond	9		2	0	4	4	0	1	0	0	46
Roanoke	4		0	1	1	7	0	0	0	0	17
West Virginia:											

[1] Imported cases.

City reports for week ended Oct. 21, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Virginia—Contd.											
Charleston	2	------	0	0	1	1	0	0	[1] 6	0	9
Huntington	3	------	0	0	0	18	0	0	0	0	0
Wheeling	0	------	0	0	2	3	0	0	2	0	11
North Carolina:											
Raleigh	3	------	0	0	0	12	0	1	0	0	18
Wilmington	2	------	0	0	1	4	0	1	0	0	12
Winston-Salem	10	------	0	0	2	10	0	0	0	0	14
South Carolina:											
Charleston	0	12	0	0	3	1	0	1	0	0	28
Columbia	0	------	0	0	2	0	0	0	0	0	11
Greenville	1	------	0	0	0	1	0	1	0	2	12
Georgia:											
Atlanta	14	11	0	0	5	7	0	2	0	3	80
Brunswick	0	------	0	1	0	0	0	0	0	0	4
Savannah	1	10	0	0	1	2	0	1	1	0	28
Florida:											
Miami	2	1	0	1	0	0	0	0	2	1	15
Tampa	2	3	3	0	0	0	0	1	0	0	29
Kentucky:											
Ashland	6	------	0	0	0	6	0	0	2	0	--------
Lexington	5	1	0	0	2	6	0	1	0	0	16
Louisville	37	3	0	0	4	18	0	4	1	2	66
Tennessee:											
Memphis	5	------	1	0	5	15	0	6	4	1	86
Nashville	8	------	0	0	5	11	0	1	1	0	67
Alabama:											
Birmingham	5	4	2	0	3	13	0	2	0	0	71
Mobile	3	------	0	0	0	0	0	1	0	3	25
Montgomery	4	------	--------	0	-------	5	0	-------	0	0	--------
Arkansas:											
Fort Smith	1	------	--------	0	-------	1	0	-------	0	0	--------
Little Rock	[2] 1	------	0	4	2	1	0	1	0	0	4
Louisiana:											
New Orleans	12	2	3	2	15	9	0	13	4	0	140
Shreveport	10	------	0	0	2	1	0	1	1	0	18
Texas:											
Dallas	20	------	0	0	1	5	0	4	0	0	57
Fort Worth	4	------	0	0	6	6	0	0	1	0	34
Galveston	0	------	0	0	1	0	0	0	0	0	11
Houston	18	------	0	2	6	3	0	3	0	0	67
San Antonio	2	------	0	0	0	1	0	8	0	0	57
Montana:											
Billings	0	------	0	0	0	0	0	0	0	1	5
Great Falls	0	------	0	1	0	0	0	1	0	0	11
Helena	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	------	0	0	0	3	0	0	0	0	3
Idaho:											
Boise	0	------	0	0	0	0	0	1	0	0	8
Colorado:											
Denver	1	16	0	3	4	10	3	5	2	28	71
Pueblo	0	------	0	0	1	0	0	1	2	2	10
New Mexico:											
Albuquerque	0	------	0	0	0	2	0	4	3	0	8
Utah:											
Salt Lake City	3	------	0	11	2	3	0	0	0	6	26
Nevada:											
Reno	0	------	0	0	0	0	0	0	0	0	2
Washington:											
Seattle	1	------	--------	0	-------	3	0	-------	0	14	--------
Spokane	0	1	1	6	3	0	0	1	0	3	30
Tacoma	0	------	0	0	2	1	0	1	0	1	26
Oregon:											
Portland	0	------	1	0	4	21	4	1	0	0	83
Salem	0	1	0	0	0	0	0	0	0	0	0
California:											
Los Angeles	27	21	0	5	16	35	0	17	0	39	285
Sacramento	2	------	0	1	1	6	0	4	4	4	30
San Francisco	3	------	0	2	4	3	0	8	2	7	157

[2] Nonresident.

City reports for week ended Oct. 21, 1933—Continued

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Maine:			
Portland	0	0	1
Massachusetts:			
Boston	0	0	2
Worcester	0	0	1
New York:			
New York	1	0	6
Syracuse	0	0	2
New Jersey:			
Newark	0	0	1
Trenton	1	0	0
Pennsylvania:			
Philadelphia	0	1	0
Pittsburgh	0	0	1
Ohio:			
Cincinnati	0	0	1
Cleveland	0	0	4
Toledo	0	0	1
Indiana:			
Indianapolis	3	0	0
Illinois:			
Chicago	4	1	1
Michigan:			
Detroit	0	0	2
Minnesota:			
Duluth	0	0	3
Minneapolis	0	0	6
St. Paul	0	0	1
Iowa:			
Des Moines	0	0	1
Missouri:			
St. Joseph	0	0	1
St. Louis	0	0	1
Georgia:			
Atlanta	0	0	1
Louisiana:			
New Orleans	1	0	0
Colorado:			
Denver	0	1	0
Utah:			
Salt Lake City	0	0	1
Washington:			
Seattle	1		3
California:			
Los Angeles	0	0	1
San Francisco	0	0	1

Lethargic encephalitis.—Cases: New York, 3; Philadelphia, 1; Springfield, Ill., 1; Kansas City, Mo., 4; St. Louis, 14; Louisville, 3; Nashville, 1; Fort Worth, Tex., 1; San Antonio, 2; Portland, Oreg., 1; Sacramento, 1.

Pellagra.—Cases: Philadelphia, 1; Lynchburg, Va., 3; Charleston, S.C., 2, Dallas, Tex., 2.

Typhus fever.—Cases: Savannah, 1; Tampa, 2; Galveston, Tex., 1. Deaths: Galveston, 1.

FOREIGN AND INSULAR

CANADA

Quebec Province—Communicable diseases—Two weeks ended October 21, 1933.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended October 21, 1933, as follows:

Disease	Cases	Diseases	Cases
Cerebrospinal meningitis	1	Ophthalmia neonatorum	1
Chicken pox	133	Poliomyelitis	9
Diphtheria	49	Scarlet fever	160
Erysipelas	5	Tuberculosis	95
German measles	3	Typhoid fever	147
Influenza	1	Whooping cough	183
Measles	59		

CZECHOSLOVAKIA

Communicable diseases—August 1933.—During the month of August 1933 certain communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Diseases	Cases	Deaths
Anthrax	17		Paratyphoid fever	38	2
Cerebrospinal meningitis	5	1	Poliomyelitis	18	2
Chicken pox	34		Puerperal fever	38	18
Diphtheria	1,636	97	Scarlet fever	1,192	19
Dysentery	14		Trachoma	131	
Influenza	26	1	Typhoid fever	654	35
Malaria	232		Typhus fever	1	

PUERTO RICO

Notifiable diseases—Four weeks ended October 7, 1933.—During the 4 weeks ended October 7, 1933, cases of certain notifiable diseases were reported in the municipalities of Puerto Rico, as follows:

Disease	Cases	Disease	Cases
Chicken pox	20	Pellagra	3
Diphtheria	45	Pink eye	1
Dysentery	173	Ringworm	11
Erysipelas	2	Syphilis	12
Filariasis	40	Tetanus	2
Influenza	47	Tetanus (infantile)	6
Malaria	3, [illegible]	Trachoma	[illegible]
Measles	83	Tuberculosis	476
Meningeal tuberculosis	1	Tuberculosis (intestinal)	1
Mumps	64	Typhoid fever	35
Ophthalmia neonatorum	6	Whooping cough	123
Paratyphoid fever	1		

NOTE.—The above figures are a continuation of the table on p. 1235 of the Public Health Reports of Sept. 29, 1933, and not of the table on p. 1275.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Oct. 27, 1933, pp. 1328–1330. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Nov. 24, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Philippine Islands.—During the week ended October 28, 1933, cholera was reported in the Philippine Islands as follows: Antique Province, Dao, 8 cases, 10 deaths; Bohol Province, Clarin, 2 cases, 2 deaths, Inabanga, 7 cases, 8 deaths, Jetafe, 41 cases, 19 deaths, Tubigon, 2 cases, 2 deaths; Cebu Province, Cebu City, 6 cases, 2 deaths, Talisay, 1 case, 1 death, Toledo, 3 cases, 1 death; Iloilo Province, Lawigan, 1 case, 1 death, San Joaquin, 11 cases, 10 deaths. From October 1 to 8, 1933, cholera was reported in Samar Province as follows: Gandara, 2 cases, Santa Margarita, 5 cases, 4 deaths, and Tarangnan, 4 cases, 4 deaths.

Typhus Fever

Irish Free State—Kerry county—Dingle.—During the week ended October 14, 1933, 4 cases of typhus fever were reported in Dingle, Kerry County, Irish Free State.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

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NOVEMBER 17 - - 1933

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Quarantinable and Other Diseases in Foreign Countries

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 18, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of public health.

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PUBLIC HEALTH REPORTS

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ACUTE RESPONSE OF GUINEA PIGS TO VAPORS OF SOME NEW COMMERCIAL ORGANIC COMPOUNDS

VII. DICHLOROETHYL ETHER [1]

By H. H. SCHRENK, *Chemist in Charge, Toxicological and Biochemical Laboratory;* F. A. PATTY, *Associate Chemist;* and W. P. YANT, *Supervising Chemist; Health Laboratory Section, Pittsburgh Experiment Station, United States Bureau of Mines*

This report on the acute response of guinea pigs to BB′ dichloroethyl ether vapor is the seventh of a series of similar reports [2] which deal with studies pertinent to establishing a criterion of the toxicity of the vapor of some chemical products which have recently reached, or promise to reach, important domestic or industrial use.

SCOPE OF WORK

The scope of the work included a study of the toxicity and physiological response of guinea pigs exposed to vapors of dichloroethyl ether. Only acute effects as produced by a single exposure were studied. The experiments were planned to cover a range of concentrations which would produce but slight or no response, moderate response, and serious response.

CHEMICAL AND PHYSICAL PROPERTIES

The dichloroethyl ether used in this study is the BB′ dichloroethyl ether. A detailed description of the chemical and physical properties has been given by Fife and Reid.[3] It is a colorless liquid practically

[1] Published by permission of the Director, U.S. Bureau of Mines. Work completed on manuscript April 17, 1933.

[2] Sayers, R. R., Yant, W. P., Waite, C. P., Patty, F. A., and Schrenk, H. H.: Acute Response of Guinea Pigs to Vapors of Some New Commercial Organic Compounds—

I. Ethylene Dichloride. Pub. Health Rep., vol. 45, no. 5, Jan. 31, 1930, pp. 225-239. (Reprint no. 1349.)

II. Ethyl Benzene. Pub. Health Rep., vol. 45, no. 22, May 30, 1930, pp. 1241-1250. (Reprint no. 1379.)

III. Cellosolve. Pub. Health Rep., vol. 45, no. 26, June 27, 1930, pp. 1459-1466. (Reprint no. 1389.)

IV. Ethylene Oxide. Pub. Health Rep., vol. 45, no. 32, August 8, 1930, pp. 1832-1843. (Reprint no. 1401.)

V. Vinyl Chloride. Pub. Health Rep., vol. 45, no. 34, August 22, 1930, pp. 1963-1971. (Reprint no. 1405.)

VI. Dioxan. Pub. Health Rep., vol. 45, no. 35, August 29, 1930, pp. 2023-2032. (Reprint no. 1407.)

[3] Fife, H. R., and Reid, E. W.: New industrial solvents. Ethylene dichloride, dichloroethyl ether, and isopropyl ether. Ind. & Eng. Chem., vol. 22, 1930, pp. 513-515.

insoluble in water but soluble in most organic solvents. It is stable, being quite resistant to alkaline hydrolysis at room temperature. Common physical properties are: Freezing point, −51.7° C.; boiling point, 178.0° C.; specific gravity, 1.22 (20°/20° C.); vapor pressure, approximately 0.73 mm at 20° C.; flash point, 131°F.

It has a pungent odor and is very irritating to the eyes (lacrimosal) and mucous membranes.

SUGGESTED USES OF DICHLOROETHYL ETHER

Dichloroethyl ether is an active solvent for fats, tars, waxes, resins, and similar materials. While not a solvent for the cellulose esters, in combination with alcohol it is an active solvent. It has possibilities of use in the textile industries, either for removing spots or by incorporating in soaps. From a purely chemical standpoint its constitution lends itself to synthesis of other useful compounds.

TEST APPARATUS

The apparatus for preparing the vapor-air mixtures was, in general, the same as that described in a previous report dealing with methanol;[4] however, in certain experiments modifications were introduced. In preparing the highest concentration available (approximately 0.1 percent vapor in air by volume), all the chamber openings were closed and air was blown by means of a fan across a series of wicks suspended in a reservoir of dichloroethyl ether. The fan and saturator were allowed to operate for three hours before the guinea pigs were placed in the chamber, in order to create as near a saturated condition as could be attained in practical use of the chemical at room temperatures.

In all the subsequent concentrations studied (below saturation) the vapor-air mixture was maintained by continuously vaporizing a measured quantity of the liquid in a measured volume of air. To ensure complete vaporization, the liquid was first pumped to an atomizer in the chamber and was atomized into the air, a large gauze cloth being suspended to catch any particle too large to vaporize before reaching the gauze. A large fan continuously blowing air over this gauze vaporized the material and kept the air well stirred.

COMPUTATION AND ANALYSIS OF VAPOR-AIR MIXTURES

No computation of the vapor concentration of saturated air was possible except on the basis of vapor pressure, but in the other cases the concentration was calculated from the quantity of liquid vaporized and the quantity of air flowing through the chambers. The calculated composition was always checked by chemical analysis. The method of analysis consisted of passing a measured volume of the

[4] Yant, W. P., Schrenk, H. H., and Sayers, R. R.: Methanol antifreeze and methanol poisoning. Ind. & Eng. Chem., vol. 23, 1931, pp. 551–555.

atmosphere through two simple, bubble-type absorption tubes containing a saturated solution of alcoholic potassium hydroxide. The solution was then heated to about 100° C. for 1 to 2 hours to aid in the hydrolysis of the dichloroethyl ether. The resulting inorganic chlorides were determined by the Volhard method.

The accuracy of the method was checked by preparing a standard solution of dichloroethyl ether in alcohol and hydrolyzing known volumes of this solution with alcoholic potassium hydroxide at a temperature which just produced simmering. Table 1 gives the results of duplicate analyses.

TABLE 1.—*Results of analysis of samples containing known amounts of dichloroethyl ether*

Dichloroethyl ether taken	Volume of alcoholic KOH used	Length of time heated	Dichloroethyl ether recovered		Percent recovery		Average percent recovery
mg	*cc*	*Hours*	*mg*	*mg*			
12.20	5	1	12.38	12.02	101.5	98.5	100.0
12.20	10	1	12.20	12.02	100.0	98.5	99.3
24.40	10	1	23.72	23.36	97.2	95.7	97.0
24.40	20	1	23.92	24.04	98.0	98.5	98.3
24.40	20	½	22.82	23.43	93.5	96.0	94.8
24.40	20	2	24.28	24.17	99.5	99.0	99.3

Three samples of saturated air were obtained by passing air through two bead towers containing dichloroethyl ether. The first tower was heated to 100° C. and the second to 22° C. The effluent air was passed through two absorption tubes containing a saturated solution of alcoholic potash. The results are given in table 2.

TABLE 2.—*Amount of dichloroethyl ether in saturated air at 22° C. and 745 mm mercury pressure*

Volume of air	Amount of dichloroethyl ether		Total dichloroethyl ether	Percent dichloroethyl ether by volume
	First absorption tube	Second absorption tube		
cc	*mg*	*mg*	*mg*	
2,000	17.2	2.2	19.4	0.16
2,000	15.9	1.2	17.1	.14
2,000	15.9	1.3	17.2	.14

A measured volume of 1 percent dichloroethyl ether in 95 percent alcohol, and also a measured amount of pure dichloroethyl ether were volatilized and the air was passed through alcoholic potash in the absorption tubes. Table 3 gives the results.

TABLE 3.—*Results of recovery of dichloroethyl ether from air after volatilization*

Dichloroethyl ether volatilized	Dichloroethyl ether recovered	Percent recovery
mg	*mg*	
24.4	24.02	98.5
24.4	22.68	93.0

Table 4 gives the results of the computed concentration and the concentration found by chemical analysis for atmospheres used in animal experiments.

TABLE 4.—*Results of analysis of atmospheres used for animal exposures* [a]

Concentration by—		Concentration by—		Concentration by—	
Computation	Analysis	Computation	Analysis	Computation	Analysis
[b] 0.14	0.096	0.060	0.057	0.012	0.0104
[b] .14	.106	.060	.058	.012	.0109
[b] .14	.103	.055	.046	.012	.0104
[b] .14	.095	.055	.049	.004	.0035
.063	.064	.030	.026	----------	----------
.060	.050	.030	.027	----------	----------

[a] Concentration in percent by volume at 25° C. and 760 mm pressure. To convert to milligrams per liter, multiply by 58.5.

[b] Air saturated with dichloroethyl ether at 100° C. and bubbled through dichloroethyl ether at 22° C. contained 0.14 percent vapor. The vapor pressure at 20° C. is approximately 0.73 mm, which would probably be 1.0 to 1.1 mm at 25°, or equivalent to 0.13 or 0.14 percent.

A survey of the results (table 1) shows that when heated from 1 to 2 hours the hydrolysis is complete and that a recovery of 97 to 100 percent can be obtained. When heated for only one half hour the hydrolysis is essentially complete, an average recovery of 94.8 percent being obtained on duplicate samples. Table 2 shows that the vapor may be absorbed in saturated alcoholic potash if two absorption tubes are connected in series, the first retaining 75 to 90 percent of the dichloroethyl ether and the second 10 to 25 percent, a total recovery of more than 95 percent being readily obtainable.

It will also be noted from table 2 that in a laboratory experiment designed to find the concentration in air saturated at room temperature the amount present was 0.14 percent, while in actual experience with the wick device used for animal experiments the highest concentration attainable in the exposure chamber was 0.10 percent (table 4; also see footnote). The reason for this discrepancy is probably due in the main to the fact that the air in the chamber was not completely saturated. However, it is possible that the experimental value (0.14) is somewhat high, owing either to supersaturation, or to the presence of a more volatile halogen constituent or a combination of both. The remainder of the results in table 4 represent atmospheres prepared by volatilizing a measured amount of dichloroethyl ether in a measured volume of air, and the concentra-

tions computed on this basis are in better agreement with the chemical determinations. The latter are rather consistently about 10 to 15 percent lower than the computed results. Part of this discrepancy is attributed to the lack of complete absorption and recovery by the method of analysis (see table 3). The agreement, however, is close enough to establish the conditions of experiment.

TEST PROCEDURE, DESCRIPTION, AND CARE OF ANIMALS

The test procedure, description, and care of animals were the same as those presented in a previous report of experiments with ethylene dichloride,[5] except that it was unnecessary to observe the precautions for dealing with explosive atmospheres.

RESULTS OF TESTS

The detailed test data are too voluminous to be presented in this report, and only summarized results pertinent to objective symptoms, gross pathology, and fatality are given.

OBJECTIVE SYMPTOMS IN ANIMALS

Control animals.—No symptoms were exhibited by the 26 control guinea pigs in these tests, and no deaths occurred.

Exposed animals.—Concentrations of 0.055 to 0.1 percent of dichloroethyl ether vapor by volume in air produced immediate intense irritation of the conjunctiva and nasal mucous membrane, as evidenced by lacrimation and squinting of the eyes and by scratching at the nose with the forepaws. The other symptoms noted were gradual decreasing motility, slight retching and slow laborious respiration gradually becoming shallow and rapid, loss of consciousness, and an occasional deep sighing type of respiration just preceding death. Unsteadiness or what might be interpreted as slight signs of vertigo were observed after removal from exposure, in pigs exposed to 0.1 percent for 90 minutes. Unsteadiness undoubtedly occurred in other pigs exposed for even shorter periods to 0.1 percent, but due to lack of motility it was not definitely observed.

Exposure to 0.026 percent produced a similar symptom picture, but the time required to produce the symptoms was longer, and unconsciousness did not occur until about 450 minutes. The symptom picture for 0.01 percent was similar to that produced by 0.026 percent, except that distinct lacrimation did not occur at any time and again the symptoms were slower in appearing than they were for the higher concentration. Unconsciousness occurred in about 780 minutes. Exposure to 0.0035 percent produced no symptoms during

[5] See footnote 2.

an 810-minute exposure, excepting slight nasal irritation, which occurred after 3 to 10 minutes.

Table 5 gives the average time required to produce the symptoms observed for exposure to 0.1, 0.055, 0.026, 0.0105, and 0.0035 percent by volume dichloroethyl ether vapor in air.

TABLE 5.—*Symptoms produced in guinea pigs during exposure to dichloroethyl ether vapor in air*

Type of symptom	Period of exposure causing symptoms with vapor concentration of—[a]				
	0.1	0.055	0.026	0.0105	0.0035
Nasal irritation:					
Scratching at nose	([b])	([b])	1	2	3-10
Eye irritation:					
Squinting	([b])	([b])	1	20	[c](810)
Lacrimation	1-2	1-2	3	[c](810)	[c](810)
Disturbance in respiration	90	180	310	450	[c](810)
Animals on sides, unable to stand; quiet; dyspnea; gasping respiration	180-300	240-480	445-600	525-810	[c](810)
Death	230-330	360-500	450-740	([d])	[c](810)

[a] Concentration of vapor in percent by volume; time in minutes.
[b] Occurs immediately after start of exposure.
[c] Not observed in the maximum exposure period given in parentheses.
[d] Four died within a period ranging from immediately after to 250 minutes after exposure. Two survived 8 days and were killed for autopsy.

GROSS PATHOLOGY

Control animals.—A total of 26 control guinea pigs were killed for autopsy. These animals were taken from the same stock and were selected in the same manner as were the group of animals used for exposure to dichloroethyl ether vapor-air mixtures. No significant gross pathology was found in the control animals.

Exposed animals.—The gross pathology in animals that died during or after exposure to dichloroethyl ether vapor was moderate to marked congestion of the brain, severe congestion of the lungs and nasal passages, including trachea and bronchi, with emphysema, edema, and hemorrhages of lungs and occasional complete consolidation. These findings were present in animals that died during and after exposure, but tended to be more severe the longer the exposure and in those animals that died after exposure. The liver was markedly congested and the kidneys were slightly congested.

The findings in animals killed immediately after an exposure of 90 minutes to 0.1 percent vapor revealed no gross pathology except slight congestion of the lungs, whereas animals similarly exposed but allowed to live died within 24 hours and autopsy revealed the severe lung pathology described previously, thus showing a delayed response to the vapor. Animals exposed 10 minutes and 30 minutes to 0.1 percent vapor showed slight congestion of the lungs and slight to moderate congestion of kidneys and liver. Those exposed 10 minutes and killed 4 and 8 days after termination of exposure were nega-

tive, while those exposed 30 minutes evidenced congestion of the lungs after 4 days but were negative after 8 days. In general, the majority of the animals exposed to conditions (see fig. 1) causing two or more deaths in a group of six pigs, exhibited more severe congestion, edema, and hemorrhage after 4 days than immediately after exposure, and showed congestion of the lungs in the majority of instances after 8 days. Those animals exposed to conditions causing some damage but no deaths exhibited slight to moderate congestion of the lungs, liver, and kidneys, and in some instances slight congestion of the brain immediately after exposure, and similar or more congestion after 4 days, while after 8 days the condition was either improved or entirely negative.

DISCUSSION OF PATHOLOGY

Dichloroethyl ether is an intense irritant to the respiratory passages and lungs, causing congestion, edema, and hemorrhage of the lung, which progresses with time to, in some instances, complete consolidation, often giving rise to a delayed death 1 to 8 days after exposure. As would be expected under such conditions, the brain shows moderate to marked congestion. Congestion of the liver and kidneys was evident in varying degree. The pathology of dichloroethyl ether is of a nature similar to that produced by other respiratory irritants, such as the acid gases.

FATALITY AND SUMMARY OF PHYSIOLOGICAL RESPONSE

A summary of the fatality and response of guinea pigs exposed to various concentrations of dichloroethyl ether is shown graphically in figure 1. The results of each experiment are designated by a symbol which represents one of six different degrees of severity which occurred in the majority of a group of six pigs.

The six degrees of response are given in the legend on figure 1. In addition to representing the response of each group by symbols, the symbols have been separated into three general zones of probable response.

Conventional degrees of response are given in table 6 for comparison with toxicological data given in the literature for other compounds.[6 7 8 9 10]

[6] See footnote 2.

[7] Flury, F., and Zernik, F.: Schädliche Gase. Berlin, 1931. Verlag von Julius Springer.

[8] Sayers, R. R., Yant, W. P., Thomas, B. G. H., and Berger, L. B.: Physiological response attending exposures to methyl bromide, methyl chloride, ethyl bromide, and ethyl chloride. Pub. Health Bull. No. 185, United States Public Health Service, 1929, 56 pp.

[9] International critical tables, first ed., 1927, vol. 2, p. 318. Also see errata sheet, vol. 2.

[10] Henderson, Y., and Haggard, H. W.: Noxious gases: American Chemical Society Monograph No. 35, 1927. Chem. Catalog Co., New York.

TABLE 6.—*Acute effects of exposure of guinea pigs to vapor-air mixtures of dichloroethyl ether*

Effects of exposure after various periods of time	Concentration, percent by volume
Kills in a few minutes	(a)
Dangerous to life in 30 to 60 minutes	0.05 to 0.10
Maximum amount for 60 minutes without serious disturbances	0.010 to 0.020
Slight symptoms after several hours or maximum amount without serious disturbances	0.0035

a Not produced by 0.1 percent, the highest concentration attained by evaporation in a closed chamber at 22° C.

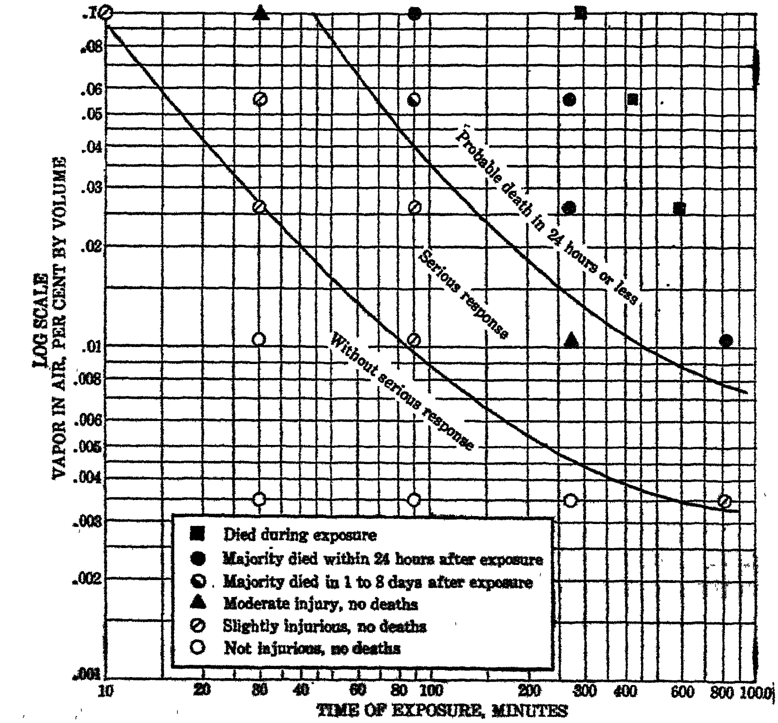

FIGURE 1.—Acute effects of exposure of guinea pigs to dichloroethyl ether vapor in air

CAUSE OF DEATH DURING AND FOLLOWING EXPOSURE

Death was due principally to lung irritation and its sequelae, whether the animal died during or following exposure. The action of this compound may therefore be considered as primarily that of a respiratory irritant.

WARNING PROPERTIES AND HAZARDS OF ACUTE POISONING FROM DICHLOROETHYL ETHER VAPOR

Concentrations of 0.055 and 0.10 percent dichloroethyl ether vapor in air were found, on brief exposure of men, to be very irritating to the eyes and nasal passages. Lacrimation was profuse. Deep inhalations were nauseating in effect. The atmosphere was considered intolerable. A concentration of 0.026 percent vapor was similar in effect but to a lesser degree than in the above-stated concentrations, and, though very objectionable, it was not considered intolerable. The same observers found 0.01 percent vapor objectionable in that it had a slightly nauseating odor and was slightly irritating. A concentration of 0.0035 percent vapor had an easily noticeable odor which was only slightly offensive and practically free from irritation.

Its warning properties are good, especially in concentrations causing harm for short exposures. Its chief danger lies in exposure to low concentrations for a sufficient length of time to cause marked irritation to the respiratory system. It has an easily noticeable but not especially objectionable odor in such concentrations and is only slightly irritating to the nasal passages.

A comparison with toxicological data reported for other compounds [11] shows dichloroethyl ether vapor to be one of the more toxic compounds. Dichloromethyl ether (the methyl derivative corresponding to the ethyl compound studied) is reported [12] to be distinctly irritating in a concentration of 3 p.p.m. (0.0003 percent by volume). A concentration of 100 p.p.m. (0.01 percent) will incapacitate a person for warfare in a few seconds, and an exposure of 1 to 2 minutes may produce a fatal lung injury.

SUMMARY AND CONCLUSIONS

The acute physiological response of guinea pigs to air containing dichloroethyl ether vapor was determined. The concentration of vapor and periods of exposure ranged from those which produced death to those which caused no apparent effect after several hours exposure. The objective symptoms, gross pathology, and fatality are given, with a discussion of the potential health hazards. Also the warning properties as studied by the exposure of persons are described.

1. The physiological action of dichloroethyl ether is primarily irritation of the respiratory passages and the lungs.

2. In the order of their appearance the symptoms produced were nasal irritation, eye irritation, lacrimation, disturbances in respiration, dyspnea, gasping, and death. All of these appeared in concen-

[11] See footnotes 2, 7, 8, 9, and 10.

[12] See footnote 7.

trations of 0.026 to 0.10 percent vapor in air by volume. All except lacrimation were attained with 0.01 percent, while an exposure of 810 minutes to 0.0035 percent caused no symptoms other than signs of slight nasal irritation.

3. The principal gross pathological findings were congestion, emphysema, edema, and hemorrhage of the lungs. These occurred in all animals that died during or after exposure, the severity increasing with length of exposure, and also during 1 to 4 days after exposure.

4. It was not possible at room temperature to attain a concentration that would kill in a short time. Exposure to 0.10 percent for 30 to 60 minutes was dangerous to the life of guinea pigs; 0.01 to 0.02 percent is the maximum amount for 60 minutes without serious disturbance; and 0.0035 is the maximum amount for several hours exposure without serious disturbance.

5. Dichloroethyl ether possesses definite warning properties of odor, as well as eye, nose, and throat irritation in concentrations that are dangerous in an exposure of 1 hour or less. Concentrations below 0.01 percent, dangerous for exposure periods of several hours, possess an easily noticeable though not especially objectionable odor and little or no irritation.

ACKNOWLEDGMENTS

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THE HEALTH OF WORKERS IN DUSTY TRADES

A recent publication [1] completes a series of six studies conducted by the Public Health Service on the health of workers in certain dusty trades, involving specific types of dust. The series included studies of the dusts listed below:

I Cement dust (portland cement plant)
II Siliceous dust (granite-cutting industry)
III Carbon dust (anthracite and bituminous coal industries)
IV Vegetable dust (cotton-cloth manufacturing)

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[1] The health of workers in dusty trades. General statement and summary. Lewis R. Thompson, Albert E. Russell, and J. J. Bloomfield. III. Exposure to dust in coal mining. Dean K. Brundage and Elizabeth S. Frasier. (Section on pathology contributed by L. U. Gardner.) IV. Exposure to dust in a textile plant. J. J. Bloomfield and W. C. Dreessen. V. Exposure to the dusts of a silverware manufacturing plant. Jennie C. Goddard. VI. Exposure to municipal dust (street cleaners in New York City). Rollo H. Britten. Public Health Bulletin No. 208. July 1933.

The first 2 studies, I. Cement dust, and II. Siliceous dust, were published as Public Health Bulletins 176 and 173.

V Dusts from silverware manufacturing processes

VI Municipal dust (street sweepers)

In these studies physical examinations and X-rays were supplemented by the observation of groups of workers over a considerable period of time for the purpose of learning something of the character and severity of the sickness they experienced and of correlating such illnesses with occupational environment.

The groups examined were subjected to careful occupational analyses. Dust determinations were made by the same investigator in all the studies, in such a manner as to obtain a fairly accurate estimate of the dustiness of the occupation, the upper and lower limits, and the changes which might take place, especially at different seasons of the year. A general chemical and careful petrographic analysis of the dust was made.

Sanitary surveys, with special reference to the dust hazard, were conducted in each plant.

A sickness record was kept for each person in the group under consideration. Information regarding the nature of the illness and the duration of the case was obtained.

During the period of study a large percentage of the groups under observation were given a general physical examination. Each worker who showed any evidence of lung pathology was placed in a special group for further examination. X-rays were taken of the chests of most of these special cases and sputum examinations made where necessary.

In a few of the studies special analyses were made of mortality data covering a long period of time. Such information was of particular value in the coal and granite-cutting studies.

A few autopsies were performed and the findings are included in the report.

In measuring the effect of dust exposure upon the incidence of disabling sickness in these various industrial groups, it appears that a fairly satisfactory index is the frequency of cases of respiratory disease causing disability for more than one week. In this way attention is placed upon the more serious disabilities, and, furthermore, comparison with other industrial groups is facilitated. The highest rate by far was for granite cutters, especially for pulmonary tuberculosis. Respiratory disease rates were also relatively high for anthracite-coal miners and for employees of the cement plant. For the other dust studies (i.e., soft-coal mining, a textile plant, silverware manufacturing, and street cleaning) the 8-day and longer respiratory-disease rates were not much above the average for male industrial workers generally.

There was a difference in the nature of the respiratory diseases occurring among persons exposed to different kinds of dust. Out-

standing was the very high rate for pulmonary tuberculosis in the granite-cutting plants. The hard-coal group showed high rates for influenza (grippe) and for bronchitis. Influenza occurred at unusual frequency among the employees of the cement plant (in spite of the fact that no epidemic of consequence was noted during the record-keeping period). There was some excess of pleurisy in the granite and hard-coal industries.

The physical examination and X-ray findings in this series of studies clearly indicate an association between the amount and character of dust in the working atmosphere and the effect on the health of the exposed worker. Serious physical impairment was noted only where the workers were exposed for long periods to large amounts of dust containing a high percentage of quartz. Where the dust concentration and quartz percentage were relatively low, there was found only a mild fibrosis which could not in most cases be regarded as due to the particular dust.

The accompanying table gives estimates of the degree of the dust hazard in the different studies.

Summary of degree of dust hazard in the 6 studies

Study	Average dust count in millions of particles per cubic foot of air	Average percentage of free silica (quartz)	Other characteristics of dust	Degree of hazard (under conditons as observed in each study)
Granite cutting:				
a. Hand - pneumatic tool operators.	59	35	Remainder mostly combined silica.	Great excess of pulmonary tuberculosis after 15 years or more exposure; silicosis in from 2 to 10 years.
b. Surface - machine operators, etc.	36			Silicosis after prolonged exposure; no excess of tuberculosis.
c. General air	20			Negative except for occasional nondisabling silicosis.
d. Less than general air	9			
Anthracite coal:				
Rock drillers	82	31	Siliceous rock	Data insufficient; other studies show severe hazard.
Miners and miners' helpers.	232	1.5	Carbon and inorganic matter.	Dyspnoea and other signs of pneumoconiosis; excess sickness from respiratory conditions; excess mortality from influenza-pneumonia and possibly tuberculosis.
Bituminous coal:				
Rock drillers	78	54	Sandstone	Data insufficient; other studies indicate severe hazard.
Loaders and machine men.	112	1.2	Carbon	Generalized fibrosis chiefly linear in character; excess mortality from influenza and pneumonia.
Cement	26	6-8	Primarily lime	Some early pneumoconiosis; excess of diseases of upper respiratory tract and of influenza.
Cotton-cloth manufacturing.	7		Vegetable and silica	Negative.
Silverware manufacturing	5	1.7	Metal and other	Do.
Municipal	4		Not determined	Do.

PROMPT REPORTS REQUESTED OF CASES OF AMOEBIC DYSENTERY

Because of reports of an unusual number of cases of amoebic dysentery occurring in Chicago and several cases at other localities but having their origin in Chicago, the United States Public Health Service has requested State health authorities to be on the alert for cases and to report them promptly. The following is a copy of a letter recently sent out to the State health officers asking their cooperation:

NOVEMBER 14, 1933.

To All State Health Officers:

Reports to the Public Health Service from the City Health Officer of Chicago, Ill., indicate that amoebic dysentery has appeared in that city, originating from chronic cases and carriers among food handlers. From early in July of this year to November 9, 79 cases with 7 deaths were identified in Chicago, and 34 cases with 8 deaths, having origin in Chicago, have been traced to other places. The diagnoses were confirmed in all cases by laboratory examinations.

In many instances these cases were not generally recognized as amoebic dysentery and some of them have been mistaken for other conditions, such as appendicitis or ulcerative colitis.

It is suggested that physicians and local health officers be advised to be on the alert for cases of this disease, especially those having possible origin in Chicago. In order to get a comprehensive picture of this outbreak it is requested that prompt reports be made to the Public Health Service of all cases of amoebic dysentery occurring in your State, whether they can be traced to the Chicago outbreak or not, but especial interest is centered in those having possible origin in Chicago.

BIOLOGICAL PRODUCTS

ESTABLISHMENTS LICENSED FOR THE PROPAGATION AND SALE OF VIRUSES SERUMS, TOXINS, AND ANALOGOUS PRODUCTS

There is presented herewith a list of the establishments holding licenses issued by the Treasury Department in accordance with the act of Congress approved July 1, 1902, entitled "An act to regulate the sale of viruses, serums, toxins, and analogous products in the District of Columbia, to regulate interstate traffic in said articles, and for other purposes."

The licenses granted to these establishments for the products mentioned do not imply an endorsement of the claims made by the manufacturers for their respective preparations. The granting of a license means that inspection of the establishment concerned and laboratory examinations of samples of its products are made regularly to insure the observance of safe methods of manufacture, to ascertain freedom from contamination, and to determine the potency, or safety, or both, of diphtheria antitoxin, scarlet fever streptococcus antitoxin, tetanus antitoxin, botulinus antitoxin, antidysen-

teric serum, antimeningococcic serum, antipneumococcic serum, bacterial vaccines made from typhoid bacillus, paratyphoid bacillus A, and paratyphoid bacillus B, diphtheria toxin-antitoxin mixture, diphtheria toxoid, diphtheria toxin for Schick test, scarlet fever streptococcus toxin for Dick test, scarlet fever streptococcus toxin for immunization, and the arsphenamines, the only products for which potency standards or tests have been established.

The enumeration of the products is as follows: Serums are placed first, the antitoxins, being more important, heading the list. The other products are arranged generally in the order of their origin. The items in each class are arranged alphabetically.

Establishments Licensed and Products for Which Licenses Have Been Issued

AMERICAN ESTABLISHMENTS

Parke, Davis & Co., Detroit, Mich.—License no. 1:

Diphtheria antitoxin; meningococcus antitoxin; perfringens antitoxin; scarlet fever streptococcus antitoxin; tetanus antitoxin; vibrion septique antitoxin; antianthrax serum; antidysenteric serum; antigonococcic serum; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum; hemostatic serum (Lapenta); normal horse serum; thyroidectomized horse serum; vaccine virus; rabies vaccine (Cumming); tuberculin old; tuberculin T.R.; tuberculin B.E.; tuberculin B.F.; bacterial vaccines made from acne bacillus, acne diplococcus, Brucella melitensis, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, prodigiosus bacillus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus and typhoid bacillus; diphtheria toxin-antitoxin mixture; diphtheria toxoid-antitoxin mixture; diphtheria toxoid, diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; animal epidermal extracts; animal food extracts; vegetable food extracts; pollen extracts; modified bacterial derivatives made from colon bacillus, gonococcus, paratyphoid bacillus A, paratyphoid bacillus B, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; bacterial antigens made from colon bacillus, gonococcus, pertussis bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, and streptococcus.

Mulford Biological Laboratories, Sharp & Dohme, Broad and Wallace Streets, Philadelphia, Pa.—License no. 2:

Botulinus antitoxin; diphtheria antitoxin; erysipelas streptococcus antitoxin; B. histolyticus antitoxin; B. odematiens antitoxin; perfringens antitoxin; scarlet fever streptococcus antitoxin; B. sordelli antitoxin; tetanus antitoxin; vibrion septique antitoxin; antianthrax serum; antidysenteric serum; antigonococcic serum; antimelitensis serum; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum, antivenin (Nearctic crotalidae); antivenin Bothropic; antivenin (crotalus terrificus); normal horse serum; vaccine virus; rabies vaccine (Pasteur); rabies vaccine (killed virus); tuberculin old; tuberculin T.R.; tuberculin B.E.; tuberculin B.F.; bacterial vaccines made from acne bacillus, cholera vibrio, colon bacillus, dysentery bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, micrococcus melitensis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, plague bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; sensitized bacterial vaccines made from acne bacillus, cholera vibrio, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; staphylococcus toxoid; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; pollen extracts; animal epidermal extracts; animal food extracts; vegetable food extracts; poison ivy extract; poison oak extract; pneumococcus antibody solution; bacterial antigen made from streptococci; snake venom solution.

The Cutter Laboratory, Berkeley, Calif.—License no. 8:

Diphtheria antitoxin; B. odematiens antitoxin; perfringens antitoxin; scarlet fever streptococcus antitoxin; B. sordelli antitoxin; tetanus antitoxin; vibrion septique antitoxin; antianthrax serum; antistreptococcic serum; normal horse serum; vaccine virus; rabies vaccine (Pasteur); rabies vaccine (killed virus); tuberculin old; tuberculin B.F.; bacterial vaccines made from acne bacillus, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, pseudodiphtheria bacillus,

staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; bacterial antigens made from colon bacillus, staphylococcus aureus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test; pollen extracts; poison ivy extract; poison oak extract.

Bureau of Laboratories, Department of Health, Foot East Sixteenth Street, New York City.—License no. 14:

Vaccine virus.

Lederle Laboratories (Inc.), Pearl River, N.Y.—License no. 17:

Diphtheria antitoxin; erysipelas streptococcus antitoxin; B. histolyticus antitoxin; B. odematiens antitoxin; perfringens antitoxin, B. sordelli antitoxin; tetanus antitoxin; vibrion septique antitoxin; antianthrax serum; antidysenteric serum; antigonococcic serum; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum; measles immune serum; normal horse serum, vaccine virus; rabies vaccine (killed virus); tuberculin old; tuberculin B.E.; tuberculin B.F.; bacterial vaccines made from acne bacillus, Brucella melitensis, cholera vibrio, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, plague bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, staphylococcus citreus, streptococcus, and typhoid bacillus; diphtheria toxin-antitoxin mixture; diphtheria toxoid, staphylococcus toxoid; diphtheria toxin for Schick test; pollen extracts; poison ivy extract, poison oak extract, animal epidermal extracts; animal food extracts; vegetable food extracts; animal oil extracts; vegetable oil extracts, oidiomycon extract; trichophyton extract.

Bacterio-Therapeutic Laboratory, Asheville, N.C.—License no. 23

Watery extract of tubercle bacilli (von Ruck); modified tubercle bacillus derivative (von Ruck).

G. H. Sherman, M.D., Inc., 14600 East Jefferson Avenue, Detroit, Mich.—License no. 30:

Bacterial vaccines made from acne bacillus, Brucella melitensis, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, nonvirulent tubercle bacillus, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; diphtheria toxoid; pollen extracts; bacterial antigens made from colon bacillus, gonococcus, micrococcus catarrhalis, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, and streptococcus.

The Abbott Laboratories, Fourteenth Street and C.-W. Interurban Railroad Tracks, North Chicago, Ill.—License no. 43:

Bacterial vaccines made from acne bacillus, Brucella melitensis, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, micrococcus tetragenus, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; bacterial antigens made from acne bacillus, B. coli, Friedländer bacillus, gonococcus, micrococcus catarrhalis, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus; pollen extracts; animal epidermal extracts; animal food extracts; vegetable food extracts.

The Upjohn Co., Kalamazoo, Mich.—License no. 51:

Bacterial vaccines made from colon bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; pollen extracts.

E. R. Squibb & Sons' Research and Biological Laboratories, New Brunswick, N.J.—License no. 52:

Diphtheria antitoxin, erysipelas streptococcus antitoxin, scarlet fever streptococcus antitoxin, tetanus antitoxin; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum; normal horse serum; vaccine virus; rabies vaccine (Pasteur); rabies vaccine (killed virus); bacterial vaccines made from acne bacillus, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, staphylococcus citreus, streptococcus, and typhoid bacillus; bacterial antigen made from staphylococcus aureus; leucocytic extract from the horse; diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; pollen extracts; poison-ivy extract; poison-oak extract; arsphenamine, neoarsphenamine, sulpharsphenamine.

Eli Lilly & Co., Indianapolis, Ind.—License no. 56:

Diphtheria antitoxin; erysipelas streptococcus antitoxin; perfringens antitoxin; tetanus antitoxin; vibrion septique antitoxin; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum; normal horse serum; hemostatic serum (Lilly), vaccine virus; rabies vaccine (Harris); tuberculin old; bacterial vaccines made from acne bacillus, cholera vibrio, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, plague bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; bacterial vaccine made from partially autolized pneumococci; diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test; bacterial antigens made from acne bacillus, colon bacillus, gonococcus, pneumococcus, staphylococcus albus, staphylococcus aureus, and streptococcus.

Gilliland Laboratories, Marietta, Pa.—License no. 63:

Diphtheria antitoxin; scarlet fever streptococcus antitoxin; tetanus antitoxin; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum; normal horse serum; vaccine virus; rabies vaccine (Pasteur); rabies vaccine (killed virus); tuberculin old; tuberculin B.E.; tuberculin B.F.; bacterial vaccines made from acne bacillus, gonococcus, influenza bacillus, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization.

Antitoxin and Vaccine Laboratory, Department of Public Health, Commonwealth of Massachusetts, 375 South Street, Jamaica Plain, Boston 30, Mass.—License no. 64:

Diphtheria antitoxin; scarlet fever streptococcus antitoxin; antimeningococcic serum; antipneumococcic serum; vaccine virus; tuberculin old; bacterial vaccines made from paratyphoid bacillus A, paratyphoid bacillus B, and typhoid bacillus; diphtheria toxin-antitoxin mixture; diphtheria toxoid, diphtheria toxin for Schick test.

United States Standard Products Co., Woodworth, Wis.—License no. 65:

Diphtheria antitoxin; tetanus antitoxin; antimeningococcic serum; normal horse serum; vaccine virus; rabies vaccine (killed virus); bacterial vaccines made from acne bacillus, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; bacterial antigens made from staphylococcus albus, staphylococcus aureus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test.

D. L. Harris Laboratories, Metropolitan Building, St. Louis, Mo.—License no. 66:

Rabies vaccine (Harris).

The Arlington Chemical Co., Yonkers, N.Y.—License no. 67:

Bacterial vaccines made from colon bacillus, micrococcus catarrhalis, micrococcus tetragenus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, staphylococcus citreus, streptococcus; pollen extracts; animal epidermal extracts; animal food extracts; vegetable food extracts.

Dermatological Research Laboratories, 1720 Lombard Street, Philadelphia, Pa. (branch of Abbott Laboratories, Chicago, Ill).—License no. 68:

Arsphenamine; silver arsphenamine; neoarsphenamine; sulpharsphenamine; bismuth arsphenamine sulphonate; neosilver arsphenamine.

H. A. Metz Laboratories, 33 Riverside Avenue, Rensselaer, N.Y.—License no. 69:

Arsphenamine; arsphenamine diglucoside; neoarsphenamine; sodium arsphenamine; silver arsphenamine; neosilver arsphenamine; sulpharsphenamine.

Diarsenol Co. (Inc.), 771 Ellicott Square, Buffalo, N.Y.—License no. 70:

Arsphenamine; neoarsphenamine; sodium arsphenamine; sulpharsphenamine.

Mallinckrodt Chemical Works, St. Louis, Mo.—License no. 77:

Arsphenamine; neoarsphenamine; sulpharsphenamine.

Merck & Co. (Inc.), 916 Parrish Street, Philadelphia, Pa.—License no. 82:

Arsphenamine; neoarsphenamine; sulpharsphenamine; a compound of glucose with arsphenamine base.

Terrell Laboratories, Texas National Bank Building, Fort Worth, Tex.—License no. 84:

Rabies vaccine (killed virus).

Jensen-Salsbery Laboratories, Twenty-first and Penn Street, Kansas City, Mo.—License no. 85:

Botulinus antitoxin; antianthrax serum; rabies vaccine (killed virus); bacterial vaccine made from Brucella melitensis.

The Neosol Co., 72 Kingsley Street, Buffalo, N.Y.—License no. 90:

Solution of neoarsphenamine; solution of sulpharsphenamine.

Hollister Stier Laboratories, Paulson Medical and Dental Building, Spokane, Wash.—License no. 91:

Bacterial vaccines made from acne bacillus, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, pertussis bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and xerosis bacillus; pollen extracts.

Medical Arts Laboratory, Medical Arts Building, Oklahoma City, Okla.—License no. 98:

Rabies vaccine (killed virus).

Bureau of Laboratories, Michigan State Department of Health, Lansing, Mich.—License no. 99.

Diphtheria antitoxin; scarlet fever streptococcus antitoxin; tetanus antitoxin; antimeningococcic serum; vaccine virus; rabies vaccine (Cumming); tuberculin old; bacterial vaccines made from paratyphoid bacillus A, paratyphoid bacillus B, and typhoid bacillus; bacterial antigens made from colon bacillus, staphylococcus aureus, streptococcus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization.

G. D. Searle & Co., 4735 Ravenswood Avenue, Chicago, Ill.—License no. 100:

Arsphenamine; neoarsphenamine; sulpharsphenamine.

National Drug Co., 5109 Germantown Avenue, Philadelphia, Pa.—License no. 101:

Diphtheria antitoxin, perfringens antitoxin; tetanus antitoxin; vibrion septique antitoxin; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum; normal horse serum; tuberculin old; vaccine virus; rabies vaccine (killed virus); bacterial vaccines made from acne bacillus, Brucella melitensis, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; pollen extracts.

American Chemical Laboratories, 5109 Germantown Avenue, Philadelphia, Pa.—License no. 102:

Poison ivy extract; poison oak extract.

Allergy Laboratories, 1200 North Walker Street, Oklahoma City, Okla.—License no. 103:

Pollen extracts; vegetable food extracts; animal epidermal extracts.

Hixson Laboratories (Inc.), Johnstown, Ohio.—License no. 104:

Diphtheria antitoxin; tetanus antitoxin; rabies vaccine (killed virus); diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test.

C. F. Kirk Co., Bloomfield, N.J.—License no. 105:

Bacterial vaccines made from acne bacillus, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus and typhoid bacillus.

The Porro Biological Laboratories, Rhodes Medical Arts Building, Tacoma, Wash.—License no. 107:

Pollen extracts.

Knapp & Knapp, North Hollywood, Calif.—License no. 106:

Pollen extracts.

Allen-Sandlin Laboratories, 225 Breslin Building, Louisville, Ky.—License no. 109:

Bacterial antigens made from colon bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus.

Pitman-Moore Co., Zionsville, Ind.—License no. 110:

Bacterial vaccines made from acne bacillus, colon bacillus, Brucella melitensis, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, micrococcus tetragenus, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; pollen extracts.

The Wm. S. Merrell Co., Cincinnati, Ohio.—License No. 111:

Bacterial vaccines made from paratyphoid bacillus A, paratyphoid bacillus B, typhoid bacillus; bacterial antigens made from colon bacillus, staphylococcus aureus; diphtheria toxin for Schick test.

FOREIGN ESTABLISHMENTS

Institut Pasteur de Paris, Paris, France.—License No. 11. Selling agents for the United States, Mr. A. Charklian, Pasteur Vaccine Laboratories of France, 516 Fifth Avenue, New York, N.Y.:

Diphtheria antitoxin; tetanus antitoxin; antianthrax serum; antidysenteric serum; antiplague serum; antistreptococcic serum; bacterial vaccines made from cholera vibrio, plague bacillus, staphylococcus albus, and staphylococcus aureus.

Interessen Gesellschaft Farbenindustrie Aktiengesellschaft, Hoechst am Main, Germany.—License No. 24. Selling agents for the United States, The Winthrop Chemical Co., 170 Varick Street, New York City:

Diphtheria antitoxin; tetanus antitoxin; antistreptococcic serum; normal horse serum; tuberculin old; tuberculin T. R.; tuberculin B. E.; tuberculin B. F.; bacterial vaccines made from cholera vibrio, gonococcus, staphylococcus albus, staphylococcus aureus, and staphylococcus citreus; typhoid bacillus; sensitized bacterial vaccine made from typhoid bacillus; trichophyton extract; arsphenamine; neoarsphenamine; sodium arsphenamine; silver arsphenamine; neosilver arsphenamine; sulpharsphenamine; sulphoxylarsphenamine.

E. Merck, Darmstadt, Germany.—License No. 31. Selling agents for the United States, Merck & Co., 45-47 Park Place, New York City:

Tuberculin Ointment (Moro).

Connaught Antitoxin Laboratory, University of Toronto, Toronto, Canada.—License No. 73:

Diphtheria antitoxin; staphylococcus antitoxin; tetanus antitoxin; diphtheria toxoid; staphylococcus toxoid.

Laboratoire de Biochimie Médicale, 19-21 rue Van-Loo, Paris, France.—License No. 83. Selling agents for the United States, Anglo-French Drug Co., 1270 Broadway, New York City. Selling agents for Puerto Rico, Chas. Vere, Box 216, San Juan, P.R.:

Sulpharsphenamine.

Instituto Sieroterapico Milanese, via Darwin 20, Milan, Italy.—License No. 87. Selling agents for the United States, Opo-Pharmacal Co., 27 Cleveland Place, New York City:

Antianthrax serum; bacterial vaccines made from gonococcus, pneumococcus, staphylococcus albus, staphylococcus aureus, staphylococcus citreus and streptococcus; neoarsphenamine.

Boots Pure Drug Co., Ltd., Nottingham, England.—License No. 92. Selling agents for the United States, The United Drug Co., 43 Leon Street, Boston, Mass.:

Arsphenamine diglucoside.

Etablissements Mouneyrat, Villaneuve-la-Garenne, Seine, France.—License No. 94. Selling agents for the United States, G. J. Wallau, 153 Waverly Place, New York City:

Phospharsphenamine.

Sero-Bacteriological Department, Bayer-Meister-Lucius, Behringswerke, I. G. Farbenindustrie, A. G. Section, Marburg-Lahn, Germany.—License No. 97. Selling agents for the United States, The Winthrop Chemical Co., 170 Varick Street, New York City:

Bacterial vaccines made from colon bacillus, gonococcus, pneumococcus, pyocyaneus bacillus, staphylococcus albus, staphylococcus aureus, streptococcus.

Laboratoire de Bacteriophage, 75 rue Olivier de Serres, Paris, France.—License No. 108. Selling agents for the United States, Anglo-French Drug Co., 1270 Broadway, New York City:

Bacterial antigens made from colon bacillus, dysentery bacillus, enterococcus, Friedländer bacillus, paratyphoid bacillus A, paratyphoid bacillus B, pneumococcus, proteus bacillus, pyocyaneous bacillus, staphylococcus, streptococcus, and typhoid bacillus.

COURT DECISION RELATING TO PUBLIC HEALTH

Sewerage company held not liable for damages to land resulting from permanent nuisance where nuisance had existed before purchase of land by plaintiffs.—(Texas Court of Civil Appeals; *Bowie Sewerage Co.* v. *Vann et al.*, 59 S.W. (2d) 180; decided Oct. 22, 1932.) An action was brought by a husband and wife to recover damages for the depreciation in the market value of their land and also for injury to their health, alleged to have resulted by reason of the pollution by the defendant sewerage company of a creek which ran through their land. The land was purchased by the plaintiffs in 1925 and the creek was first polluted in 1916. Damages were awarded to the plaintiffs in the trial court and the sewerage company appealed.

The jury had found that the nuisance complained of was a permanent nuisance, and the court of civil appeals stated that it believed that the facts were sufficient to sustain such finding. "The question then arises", said the court, "as to whether or not plaintiffs can recover for the depreciation in the market value of their land caused by the permanent nuisance which had existed 9 years before their purchase". In holding that the plaintiffs could not recover and in rendering judgment for the company, the court said:

If the nuisance was permanent, then a cause of action accrued to plaintiffs' predecessor in title who owned the land when the pollution of the stream by reason of the flow of sewage from the septic pool across the land was first apparent. 17 C.J. 716, and authorities cited above. Whether or not he was ever compensated for that right of action does not appear from the record before us. But even if he was not, that right of action was never acquired by plaintiffs by subsequent conveyances of the land to them, since it was a personal right in him. 46 C.J. 737. It follows, then, that plaintiffs acquired the property with its market value already depreciated by reason of the permanent nuisance and, therefore, they are in no position to claim damages to which such former owner alone was entitled, if any, the measure of which was the depreciation in the market value of the property, in the determination of which personal discomforts resulting from noxious odors and germs of disease emanating from the sewage could be taken into consideration. * * *

From the foregoing conclusions it follows that the judgment of the trial court must be reversed and judgment be here rendered for appellant * * *.

DEATHS DURING WEEK ENDED OCTOBER 28, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Oct. 28, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	7,470	7,246
Deaths per 1,000 population, annual basis	10.5	10.3
Deaths under 1 year of age	531	487
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	45	40
Deaths per 1,000 population, annual basis, first 43 weeks of year	10.8	11.1
Data from industrial insurance companies:		
Policies in force	67,525,404	70,081,265
Number of death claims	12,187	12,742
Death claims per 1,000 policies in force, annual rate	9.4	9.5
Death claims per 1,000 policies, first 43 weeks of year, annual rate	9.8	9.6

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended November 4, 1933, and November 5, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Nov. 4, 1933, and Nov. 5, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932
New England States:								
Maine	2	2		4		2	0	0
New Hampshire					3		0	0
Vermont					2	1	0	0
Massachusetts	25	29		4	119	56	2	1
Rhode Island	1	4					0	1
Connecticut	9	6	2		15	2	1	0
Middle Atlantic States:								
New York	37	56	[1] 29	[1] 6	239	241	1	7
New Jersey	26	34	18	9	12	74	0	8
Pennsylvania	83	93			96	124	3	2
East North Central States:								
Ohio	140	95	4	18	28	88	1	0
Indiana	104	64	51	36	10	9	0	3
Illinois	49	114	16	10	17	54	7	4
Michigan	39	25	4	10	6	158	2	0
Wisconsin	14	11	33	18	17	87	0	0
West North Central States:								
Minnesota	14	12	1	2	1	48	0	0
Iowa [3]	13	25		5	1	4	0	0
Missouri	112	105	2		5	3	0	0
North Dakota	9	2	4		2	31	0	0
South Dakota	4	2	1	1	54	3	0	1
Nebraska	9	37	10		1	1	0	0
Kansas	38	35		1	4	10	0	1
South Atlantic States:								
Delaware		8					1	0
Maryland [2, 3]	23	26	11	8	9	1	0	2
District of Columbia	10	8			5	1	3	0
Virginia	116	62			38	34	0	0
West Virginia	124	40	10		2	29	0	1
North Carolina [4]	163	96	15	8	222	96	2	1
South Carolina [3]	32	25	327	401	28	4	0	0
Georgia [3]	52	88			32	2	0	0
Florida [3]	13	25	1	1	3	1	0	0
East South Central States:								
Kentucky	180	86	10	85	3	37	2	3
Tennessee	98	101	36	41	109	5	0	0
Alabama [3]	59	70	36	34	3	1	0	0
Mississippi	37	41					0	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Nov. 4, 1933, and Nov. 5, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932
West South Central States:								
Arkansas	33	40	6	21	15	2	1	0
Louisiana	50	38	9	9	4	2	0	0
Oklahoma [5]	118	105	19		7	1	1	3
Texas [3]	298	175	131	59	12	4	0	0
Mountain States:								
Montana	3		13		3	79	0	0
Idaho		3					0	0
Wyoming	1				1	2	0	0
Colorado	7	14			4	9	0	1
New Mexico	11	26	2	275	25		0	1
Arizona		4	9	21	32	4	0	0
Utah [2]	1	1	4	4	43		0	0
Pacific States:								
Washington	2	4	1		44		2	0
Oregon	2	3	15	32	44	25	1	1
California	50	66	70	358	169	27	3	2
Total	2,211	1,906	900	1,481	1,489	1,362	35	39

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932
New England States:								
Maine	2	7	18	15	0	0	7	6
New Hampshire	0	0	19	20	0	0	0	0
Vermont	4	0	3	3	0	0	0	0
Massachusetts	3	0	133	206	0	0	2	4
Rhode Island	0	0	10	29	0	0	0	0
Connecticut	3	0	53	54	0	0	0	4
Middle Atlantic States:								
New York	18	5	270	294	0	3	23	17
New Jersey	3	6	100	121	0	0	6	5
Pennsylvania	7	20	345	356	0	0	39	36
East North Central States:								
Ohio	13	4	656	419	0	22	39	19
Indiana	0	0	228	103	0	1	11	4
Illinois	5	4	336	315	0	1	28	19
Michigan	2	1	222	201	0	0	15	12
Wisconsin	7	1	80	78	18	3	3	4
West North Central States:								
Minnesota	12	3	60	44	4	2	2	1
Iowa [2]	1	0	97	27	1	7	1	1
Missouri	0	0	136	153	2	0	5	7
North Dakota	1	1	5	4	0	2	1	1
South Dakota	1	1	26	6	1	0	5	0
Nebraska	0	0	44	45	7	0	0	5
Kansas	2	1	139	84	5	0	9	5
South Atlantic States:								
Delaware	0	0	7	6	0	0	2	0
Maryland [2 3]	4	4	84	77	0	0	17	7
District of Columbia	0	1	5	11	0	0	6	2
Virginia	1	1	180	101	0	0	14	14
West Virginia	3	1	145	70	0	0	19	27
North Carolina [4]	0	3	232	115	1	0	9	11
South Carolina [3]	0	1	11	18	1	0	19	8
Georgia [3]	2	0	20	16	1	0	6	19
Florida [3]	0	0	4	1	0	0	0	1
East South Central States:								
Kentucky	1	1	165	74	0	3	25	23
Tennessee	2	4	130	99	0	1	25	18
Alabama [3]	1	0	64	54	0	0	12	11
Mississippi	0	1	33	46	1	2	3	[illegible]

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Nov. 4, 1933, and Nov. 5, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932
West South Central States:								
Arkansas	1	1	8	19	0	0	5	13
Louisiana	0	0	28	26	0	0	13	8
Oklahoma [5]	0	1	29	34	0	0	45	18
Texas [3]	0	1	107	64	6	2	58	16
Moutain States:								
Montana	0	0	16	4	0	3	5	3
Idaho	0	0	3	3	0	8	0	2
Wyoming	0	0	12	17	0	0	0	0
Colorado	0	1	48	46	2	0	8	1
New Mexico	0	0	25	11	0	0	26	1
Arizona	0	0	4	6	0	0	2	8
Utah [2]	1	0	5	10	0	0	2	0
Pacific States:								
Washington	3	2	27	21	3	2	2	9
Oregon	0	1	53	25	1	0	0	5
California	4	5	182	119	8	5	20	8
Total	107	83	4,607	3,670	62	67	539	383

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Nov. 4, 1933, 70 cases, as follows: Maryland, 1; South Carolina, 1; Georgia, 13; Florida, 2; Alabama, 47; Texas, 6.
[4] Rocky Mountain spotted fever, week ended Nov. 4, 1933, North Carolina, 1 case.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
September 1933										
Nevada	1	1	1				0	2	0	8
South Carolina		804	560	2,019	117	200	4	27	0	134
October 1933										
Arkansas		138	42	759	65	21	0	85	1	40
Connecticut	1	4	10		18		13	161	0	7
Delaware		4			2		1	21	0	8
District of Columbia	1	51	3		5		2	40	0	17
Maine		10	18		7		16	29	0	20
Nebraska	1	17	8		8		4	68	1	6
New Mexico		46	1	13	52		0	90	2	99
Tennessee	5	402	184	1,012	211	5	12	533	4	123

September 1933

	Cases.
Nevada:	
Chicken pox	1
Septic sore throat	2
Tularaemia	1
Whooping cough	6
South Carolina:	
Chicken pox	27
Dengue	4
Diarrhea	824
Hookworm disease	107
Lethargic encephalitis	5
Mumps	18
Ophthalmia neonatorum	49
Paratyphoid fever	17

September 1933—Continued

	Cases.
South Carolina—Con.	
Rabies in animals	10
Tularaemia	4
Typhoid fever	12
Whooping cough	148

October 1933

Chicken pox:	
Arkansas	11
Connecticut	168
Delaware	9
District of Columbia	9
Maine	113

October 1933—Continued

	Cases.
Chicken pox—Con.	
Nebraska	48
New Mexico	13
Tennessee	21
Conjunctivitis:	
Delaware	1
Dysentery:	
Connecticut (amebic)	3
Connecticut (bacillary)	1
New Mexico	5
Tennessee	24
German measles:	
Connecticut	2
Delaware	1

October, 1933—Continued

	Cases
German measles—Con.	
Maine	8
Tennessee	2
Hookworm disease:	
Arkansas	1
Impetigo contagiosa:	
Tennessee	35
Lead poisoning:	
Connecticut	1
Lethargic encephalitis:	
Arkansas	1
Connecticut	3
District of Columbia	1
Nebraska	2
New Mexico	1
Tennessee	3
Mumps:	
Connecticut	118
Maine	10
Nebraska	5

October, 1933—Continued

	Cases
Mumps—Continued.	
New Mexico	16
Tennessee	22
Ophthalmia neonatorum:	
Tennessee	1
Puerperal septicemia:	
New Mexico	3
Tennessee	1
Rabies in animals:	
Connecticut	8
Maine	2
Scabies:	
Tennessee	2
Septic sore throat:	
Connecticut	6
Maine	2
New Mexico	4
Tennessee	63
Tetanus:	
Connecticut	2
Tennessee	2

October, 1933—Continued

	Cases
Trachoma	
Arkansas	8
Tennessee	29
Undulant fever:	
Connecticut	4
Maine	5
New Mexico	1
Vincent's angina:	
Maine	2
Tennessee	11
Whooping cough:	
Arkansas	18
Connecticut	110
Delaware	25
District of Columbia	25
Maine	100
Nebraska	157
New Mexico	56
Tennessee	80

WEEKLY REPORTS FROM CITIES

City reports for week ended Oct. 28, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	0	0	0	0	1	0	4	17
New Hampshire:											
Concord	0	------	0	0	0	0	0	0	0	0	8
Nashua	0	------	0	0	0	12	0	0	0	0	0
Vermont:											
Barre	0	------	0	2	0	0	0	1	0	0	4
Burlington	0	------	0	0	0	0	0	0	0	0	5
Massachusetts:											
Boston	3	------	0	18	25	30	0	14	1	32	229
Fall River	0	------	1	0	0	3	0	0	1	4	17
Springfield	0	------	0	1	0	1	0	1	0	9	26
Worcester	1	------	0	53	7	6	0	2	0	20	52
Rhode Island:											
Pawtucket	0	------	0	0	0	3	0	0	0	0	17
Providence	1	1	0	0	2	4	0	3	0	8	56
Connecticut:											
Bridgeport	0	------	0	3	2	7	0	1	0	1	25
Hartford	0	1	0	0	0	3	0	0	1	0	37
New Haven	0	1	0	0	1	1	0	0	0	6	30
New York:											
Buffalo	3	------	0	4	22	16	0	5	0	11	114
New York	28	15	4	21	137	58	0	67	3	106	1,392
Rochester	0	------	0	0	1	2	0	1	2	7	47
Syracuse	0	------	0	0	4	2	0	0	0	12	34
New Jersey:											
Camden	4	------	0	0	3	6	0	1	0	0	38
Newark	0	8	0	2	4	9	0	4	0	33	89
Trenton	0	------	0	0	5	2	0	2	[1] 1	3	42
Pennsylvania:											
Philadelphia	2	9	7	23	32	38	0	24	6	38	466
Pittsburgh	9	1	2	2	20	26	0	3	0	19	150
Reading	2	------	0	1	2	1	0	0	0	4	25
Ohio:											
Cincinnati	14	1	2	6	9	27	0	7	0	6	128
Cleveland	12	43	3	0	7	51	0	10	0	37	186
Columbus	4	1	1	0	6	17	0	2	0	2	79
Toledo	2	1	0	0	2	17	0	3	0	2	59
Indiana:											
Fort Wayne	7	------	0	0	3	2	0	0	0	0	21
Indianapolis	3	------	0	1	15	24	0	2	0	2	------
South Bend	0	------	0	0	0	11	0	0	0	1	7
Terre Haute	0	------	0	5	1	0	0	0	0	0	19
Illinois:											
Chicago	1	5	2	7	41	91	0	38	1	51	724
Springfield	0	------	0	0	1	3	0	1	0	3	18

[1] Nonresident.

City reports for week ended Oct. 28, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Michigan:											
Detroit	12	4	2	2	12	42	0	17	3	68	213
Flint	3	------	0	0	2	23	0	1	0	0	24
Grand Rapids	0	------	2	0	0	3	0	0	0	5	38
Wisconsin:											
Kenosha	0	------	0	0	0	13	0	0	0	8	5
Madison	0	------	------	0	------	1	0	------	0	14	13
Milwaukee	8	1	1	2	4	14	0	1	0	58	81
Racine	0	------	0	1	0	5	0	0	1	5	10
Superior	0	------	0	0	0	0	0	0	0	1	6
Minnesota:											
Duluth	0	------	0	1	4	1	0	1	0	1	22
Minneapolis	5	------	1	2	4	10	0	0	0	20	89
St. Paul	0	------	0	2	5	13	0	3	2	5	55
Iowa:											
Des Moines	1	------	------	0	------	33	0	------	0	0	28
Sioux City	1	------	------	0	------	5	1	------	0	5	------
Waterloo	0	------	------	0	------	1	0	------	0	3	------
Missouri:											
Kansas City	3	------	1	1	14	16	0	9	0	1	101
St. Joseph	2	------	0	0	6	7	0	1	0	0	15
St. Louis	25	------	------	1	6	18	0	9	1	5	190
North Dakota:											
Fargo	0	------	0	0	0	2	0	1	0	2	6
Grand Forks	0	------	------	0	------	0	0	------	0	0	------
South Dakota:											
Aberdeen	0	------	------	1	------	0	0	------	1	0	------
Nebraska:											
Omaha	3	------	0	1	4	11	1	2	1	0	55
Kansas:											
Topeka	0	------	0	1	1	1	0	0	0	2	37
Wichita	0	------	0	0	1	7	0	0	0	2	29
Delaware:											
Wilmington	1	------	0	0	2	2	0	0	0	1	27
Maryland:											
Baltimore	3	4	2	2	8	22	0	9	0	35	185
Cumberland	0	------	0	0	1	4	0	0	0	0	10
Frederick	0	------	0	0	0	2	0	0	0	0	5
District of Columbia:											
Washington	12	1	0	2	9	9	0	7	2	6	146
Virginia:											
Lynchburg	2	------	0	0	0	6	0	0	1	0	12
Richmond	7	------	0	0	5	7	0	3	1	0	46
Roanoke	17	------	0	0	0	11	0	0	2	0	22
West Virginia:											
Charleston	8	------	0	0	0	3	0	1	1	0	6
Huntington	6	------	------	0	------	13	0	------	0	0	------
Wheeling	0	------	0	0	1	2	0	1	1	0	14
North Carolina:											
Raleigh	1	------	0	1	1	6	0	0	0	0	10
Wilmington	2	------	0	0	1	0	0	0	0	0	11
Winston-Salem	14	------	0	36	1	13	0	3	1	0	18
South Carolina:											
Charleston	0	11	0	0	3	1	0	2	0	0	22
Columbia	------	------	------	------	------	------	------	------	------	------	------
Greenville	1	------	0	0	2	0	0	1	0	3	16
Georgia:											
Atlanta	3	12	1	0	3	8	0	3	1	3	66
Brunswick	0	------	0	0	0	0	0	0	1	0	3
Savannah	2	25	0	0	1	0	0	2	0	1	24
Florida:											
Miami	0	------	0	0	0	0	0	2	0	0	18
Tampa	1	------	0	0	0	2	0	1	0	0	20
Kentucky:											
Ashland	4	------	------	0	------	10	0	------	5	0	------
Lexington	5	------	0	1	2	5	0	2	1	0	14
Louisville	24	3	0	0	4	16	0	2	1	0	54
Tennessee:											
Memphis	10	------	1	0	5	12	0	4	3	2	92
Nashville	7	------	0	0	5	10	0	2	1	1	47
Alabama:											
Birmingham	16	3	1	0	2	8	0	4	2	0	63
Mobile	2	------	0	1	0	0	0	0	0	0	15
Montgomery	3	------	------	0	------	2	0	------	1	3	------

City reports for week ended Oct. 28, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Arkansas:											
Fort Smith	0			0		1	0		0	2	
Little Rock	1		0	0	0	1	0	0	0	0	
Louisiana:											
New Orleans	14	4	4	1	7	7	0	11	13	0	145
Shreveport	6		0	0	0	6	0	2	0	0	47
Texas:											
Dallas	29		0	0	3	10	1	2	0	0	61
Fort Worth	11		0	0	3	2	0	0	0	0	23
Galveston	1		0	0	1	0	0	1	2	0	11
Houston	13		1	0	2	2	0	6	0	0	55
San Antonio	4		2	0	4	4	0	5	0	0	70
Montana:											
Billings	0		0	0	0	0	0	0	0	4	3
Great Falls	0		0	0	1	0	0	0	0	0	8
Helena	0		0	0	0	0	0	0	0	0	0
Missoula	0		0	0	1	0	0	0	0	0	5
Idaho:											
Boise	0		0	0	0	0	1	2	0	0	5
Colorado:											
Denver	3	27	0	1	9	12	2	7	3	20	91
Pueblo	0		0	0	0	1	0	1	2	2	11
New Mexico:											
Albuquerque	1		0	0	0	2	0	1	0	0	10
Utah:											
Salt Lake City	0		0	49	3	1	0	1	0	5	40
Nevada:											
Reno	0		0	0	2	0	0	0	0	0	5
Washington:											
Seattle	1			0	4	1	0	7	0	13	87
Spokane	0	1	1	22		1	0		0	2	20
Tacoma	0		0	0	1	4	0	1	0	2	26
Oregon:											
Portland	0		0	1	2	21	1	5	0	0	53
Salem	0	2	0	0	0	0	0	0	0	0	0
California:											
Los Angeles	25	9	1	3	7	35	8	19	1	64	229
Sacramento	0		0	3	1	5	0	4	0	1	28
San Francisco	5	1	0	3	0	10	0	9	0	20	120

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Maine:			
Portland	0	0	3
New Hampshire:			
Concord	0	0	1
Massachusetts:			
Boston	1	1	0
New York:			
New York	0	0	6
Syracuse	0	0	1
New Jersey:			
Newark	0	0	1
Trenton	0	1	0
Pennsylvania:			
Philadelphia	1	0	1
Ohio:			
Cincinnati	0	0	1
Cleveland	0	0	1
Illinois:			
Chicago	2	1	0
Michigan:			
Detroit	0	0	1
Madison	0	0	[1] 1
Minnesota:			
Minneapolis	0	0	7
St. Paul	0	0	1
Missouri:			
St. Joseph	1	0	0
St. Louis	0	0	1
North Dakota:			
Fargo	0	0	1
Nebraska:			
Omaha	0	0	1
Kansas:			
Topeka	0	0	2
Maryland:			
Baltimore	1	0	2
Georgia:			
Atlanta	1	0	0
Tennessee:			
Nashville	0	0	1
Utah:			
Salt Lake City	1	0	0
Washington:			
Seattle	0	1	0
Tacoma	0	0	1
California:			
Los Angeles	1	0	0

[1] Nonresident.

Lethargic encephalitis.—Cases: New York, 1; Camden, N.J., 1; Madison, Wis., (nonresident) 1; Kansas City, Mo., 1; St. Louis, 6; Atlanta, 1; Louisville, 1; Houston, Tex., 1.

Pellagra.—Cases: Winston-Salem, N.C., 1; Memphis, 1; New Orleans, 2.

Typhus fever.—Cases: Savannah, 1; Montgomery, Ala., 4.

FOREIGN AND INSULAR

AUSTRALIA

Vital statistics—1932.—During the year 1932, births, deaths, and deaths from certain causes were reported in Australia as follows:

Population	6,575,253
Number of births	110,933
Birth rate per 1,000 population	16.9
Number of deaths	56,757
Death rate per 1,000 population	8.6
Deaths from—	
Cancer	6,875
Cerebral hemorrhage	3,021
Congenital debility and malformation	3,174
Deaths from—Continued	
Heart disease	11,074
Nephritis	3,440
Pneumonia and broncho-pneumonia	3,441
Senility	2,750
Tuberculosis	3,004
Violence (including suicide)	3,887

YUGOSLAVIA

Communicable diseases—September 1933.—During the month of September 1933, certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	121	11	Poliomyelitis	4	
Cerebrospinal meningitis	4	1	Scarlet fever	356	13
Diphtheria and croup	727	74	Sepsis	8	2
Dysentery	288	42	Tetanus	52	24
Erysipelas	171	3	Typhoid fever	540	42
Measles	434	4	Typhus fever	5	1
Paratyphoid fever	28				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Oct. 27, 1933, pp. 1328–1339. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Nov. 24, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

India—Madras.—During the week ended October 28, 1933, 4 cases of cholera with 1 death were reported in Madras, India.

Philippine Islands.—During the week ended November 4, 1933, cholera was reported in the Philippine Islands as follows: Antique Province, Dao, 2 cases, 1 death; Bohol Province, Clareng, 16 cases, 10 deaths; Jetafe, 18 cases, 10 deaths; Tubigon, 1 case, 1 death; Cebu Province, Cebu city, 1 case, 1 death; Malibuyog, 8 cases, 4 deaths; Naga, 9 cases, 6 deaths; Talisay, 4 cases, 3 deaths; Toledo, 1 case, 2 deaths; Iloilo Province, Iloilo, 1 case, 2 deaths.

Plague

India—Bombay Presidency—Poona city.—During the week ended October 7, 1933, 176 cases of plague, with 118 deaths were reported in Poona city, Bombay Presidency, India, 115 miles by railway from Bombay.

For the week ended September 30, 1933, 1,514 cases of plague with 904 deaths were reported in Bombay Presidency, India. In Bombay city one case and one death were reported during the same week.

Typhus Fever

Chile.—From January 1 to September 9, 1933, 5,471 cases of typhus fever occurred in the 17 Provinces of Chile, of which 1,095 or 35.9 per 100,000 inhabitants proved fatal. For the same period Antofagasta Province reported 5 cases, 1 death; Aconcagua Province, 48 cases, 3 deaths; Santiago Province, 2,344 cases, 480 deaths; Colchagua Province, 220 cases, 47 deaths; Nuble Province, 420 cases, 81 deaths; Concepcion Province, 1,109 cases, 200 deaths; Bio-Bio Province, 293 cases, 71 deaths; and Cautin Province, 773 cases, 176 deaths.

A report dated November 2, 1933, states that 45 cases of typhus fever had occurred in San Pedro Atacama, 185 miles east of Antofagasta, Chile.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

VOLUME 48 :: :: NUMBER 47

NOVEMBER 24 - - 1933

IN THIS ISSUE

Summary of Current Prevalence of Communicable Diseases
Permanent Identification Marks on Fumigant Containers
Mortality Among Anthracite and Bituminous Coal Miners
Deaths in Large Cities During Week Ended November 4
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS are intended primarily for distribution to health officers, members of boards or departments of health, and those directly or indirectly engaged in or connected with public health or sanitary work. Articles of general or special interest are issued as reprints from the PUBLIC HEALTH REPORTS or as supplements, and in these forms are available for general distribution to those desiring them.

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PUBLIC HEALTH REPORTS

VOL. 48 NOVEMBER 24, 1933 NO. 47

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES [1]

October 8–November 4, 1933

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease."

Poliomyelitis.—The number of cases of poliomyelitis dropped from 1,271 for the preceding 4-week period to 602 for the 4 weeks ended November 4. Each geographic area showed a decline. Compared with recent years the current incidence was about 35 percent above that of the normal years of 1932 and 1929, but it was only about 35 percent of the incidence in the epidemic years of 1930 and 1931.

A comparison of geographic areas shows that the disease was still quite prevalent in some of the New England States. In Vermont, 20 cases were reported for the current period as against 1 case last year; in New York 118 cases as against 24 last year. The number of cases reported from New York, where the disease has been most prevalent, was, however, less than half the number reported for the preceding 4-week period. In the East North Central group, Ohio reported 76 cases as against 8 last year; in the West North Central group, Minnesota reported 55 as against 14; and in the South Atlantic group, West Virginia reported 13 as against 2 for the same period last year. The situation in the South Central and far western areas was about normal for this season of the year.

Influenza.—During the current 4-week period the influenza incidence increased about 50 percent. For the entire reporting area the number of cases totaled 3,121. The incidence still remained considerably below the level of last year (4,651 cases), but it was higher than that for the corresponding period in either of the years 1931 or 1930. While the usual seasonal increase was apparent in all sections of the country, only the New England, Middle Atlantic, and

[1] From the Office of Statistical Investigations, U.S. Public Health Service. The numbers of States included for the various diseases are as follows: Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 47; diphtheria, 48; scarlet fever, 48; influenza, 38 States and New York City. The District of Columbia is counted as a State in these reports. These summaries include only the 8 important communicable diseases for which the Public Health Service receives regular weekly telegraphic reports from the State health officers.

South Central areas reported an excess over last year. In the Northeastern sections only a 10 percent increase was reported, while in the South Central areas a 50 percent increase was noted. In the Mountain and Pacific regions 283 cases were reported for this period, as against 1,827 last year.

Scarlet fever.—The number of cases of scarlet fever increased from 8,107 for the preceding 4 weeks to 15,456 for the current period. Each geographic area reported practically the same rate of increase. The number of cases reported was the highest for this period in recent years; and this was true of each geographic area except the New England and Middle Atlantic. In those areas the incidence was considerably below that for the same period last year; it was approximately the same as in 1931, but about 35 percent higher than in 1930 and 1929. The South Central, Mountain, and Pacific areas reported the greatest increase over the corresponding period last year.

Diphtheria.—There were 8,302 cases of diphtheria reported for the current period, an increase of approximately 3,500 over the preceding 4 weeks. The rate of increase was a little higher than for the corresponding period in recent years. For the first time during the current year the incidence rose above that for a corresponding period last year. The numbers of cases for this period in 1932, 1931, and 1930 were 7,684, 9,816, and 6,461, respectively. The disease was most prevalent in the South Atlantic and South Central areas. In the South Atlantic States the number of cases (2,316) was the highest for this period in the 5 years for which data are available. The New England, Middle Atlantic, East North Central, and the Mountain and Pacific regions reported the lowest incidence in recent years.

Measles.—The number of cases of measles reported for the current period was 4,005. In relation to the same period last year the incidence was considerably lower in the New England, Middle Atlantic, and North Central and higher in the South Atlantic, South Central, Mountain, and Pacific areas. In fact, the incidence in each of the former areas was the lowest in the 5 years for which data are available, while in the latter groups it was highest in the 5 years. For the country as a whole the incidence was only about 88 percent of that reported last year. For this period in 1931 and 1930 the numbers of cases were 4,244 and 3,930, respectively.

Meningococcus meningitis.—The incidence of this disease continued very favorable during the current period. The total number of cases reported was 125, as compared with 146, 225, and 319 for the corresponding period in 1932, 1931, and 1930, respectively. The South Atlantic States again reported the highest incidence (22 cases) for this period in the 5 years for which data are available. The New England, Middle Atlantic, and West North Central areas reported sig-

nificant decreases from last year's figure, while other areas closely approximated last year's incidence.

Typhoid fever.—The incidence of typhoid fever continued to decline in all sections of the country. However, a rather slow decline in some sections, particularly the East North Central, Mountain, and Pacific, areas, seemed mostly responsible for a higher incidence for the country as a whole than was reported for this period last year. The number of cases for the 4 weeks ended November 4, was 2,326, as compared with 2,117, 3,015, and 3,140 for the years 1932, 1931, and 1930, respectively.

Smallpox.—Smallpox reached its lowest level several weeks earlier during the current year than it has in recent years, and since that time (the middle of September) the incidence has risen gradually and has been slightly higher than it was last year. For the 4 weeks ended November 4 the number of cases was 211, as against 182 last year. The number of cases reported for each of these years is still very low as compared with the same period in 1931, 1930, and 1929, when the numbers of cases were 600, 821, and 1,429, respectively.

For the current period the South Atlantic States reported 23 cases (20 of which occurred in West Virginia) as against 2 last year, and the Pacific area reported 44 as against 26. Illinois reported 40 cases as against 8 last year; but the total number of cases reported from the East North Central area, including Illinois, was only 52 as against 65 last year. Other areas closely approximated last year's incidence.

Mortality, all causes.—Deaths from all causes in large cities, as reported by the Bureau of the Census, for the 4 weeks ended November 4 averaged 10.6 per thousand inhabitants (annual basis) as compared with 10.3 and 10.6 in 1932 and 1931, respectively. For a large part of 1933 the death rate has been lower than in the corresponding periods of any preceding year, but is now remaining at about the level of 1932 and 1931.

PERMANENT IDENTIFYING MARKS ON CONTAINERS OF POISONOUS FUMIGANTS

Recently there occurred two incidents at quarantine stations of the Public Health Service which suggest the advisability of marking containers of poisonous products with permanent identifying or warning marks in lieu of the rather common practice of depending entirely on printed paper labels pasted on the containers of such products.

At the San Pedro (Calif.) quarantine station, a fumigator was ascending a boarding gangway with both arms full of 2½-pound containers of hydrocyanic acid gas to be used in the fumigation of the ship. The gangway broke, precipitating the employee and the

several containers into the water, and it was impossible to recover all the containers The second incident occurred during the tropical storm that visited the mid-Atlantic seaboard the latter part of last summer, in which the fumigant storage house at the Baltimore quarantine station was practically washed away, and many tins containing hydrocyanic fumigant material were washed overboard, some of which could not be recovered. These containers were hermetically sealed tins containing the deadly gas of hydrocyanic acid and were identified by paper labels pasted thereon. It was to be expected that these paper labels would wash off and the tins thereupon would become unidentified and particularly dangerous. In both instances the medical officers of the Public Health Service in charge of the stations gave as much publicity as possible, through the cooperation of the local press, to the dangerous character of the lost containers.

One prominent manufacturer of fumigant products has already taken the progressive step of stamping into the tops and bottoms of the tin containers of such products the words "Poison gas" and the symbolic skull and cross bones in addition to using the usual paper label. This procedure is recommended for all poisonous or dangerous products, and its general adoption should lessen the danger in the event that such products become lost or misplaced and fall into the hands of innocent persons who would otherwise be unaware and unwarned of the dangerous nature of the contents should the paper labels become detached.

MORTALITY OF COAL MINERS

As part of a study of the effect upon health of exposure to the dusts generated in the extraction of coal, mortality data for both the anthracite- and bituminous-coal miners in this country and in England and Wales have been analyzed, and the results are presented in a publication recently issued by the Public Health Service.[1]

For hard-coal miners, transcripts were obtained of the death records of Wilkes-Barre, Pa., for the period 1915–23, and of smaller cities and towns nearby for different periods between 1906 and 1925. The record for soft-coal miners is presented through the courtesy of the United States Bureau of Mines, which obtained transcripts of all the deaths occurring among adult males in the coal-producing counties of Indiana, Missouri, Illinois, and Wyoming for the period 1919–23. No figures were available as to the total number of miners among whom the deaths occurred, and so mortality rates could not be computed; but the percentage of deaths from certain

[1] Public Health Bulletin No. 210.

causes within given age limits (proportionate mortality) for the decedent miners was compared with the corresponding percentage for other adult male decedents in the same counties. On account of the large number of deaths from mine accidents, all percentages were based on disease mortality. For the coal miners of England and Wales, standardized death rates were available.

Both anthracite- and bituminous-coal miners in this country experienced an abnormally large proportion of deaths from infleunza and pneumonia during influenza epidemics and also in interepidemic periods. The mortality data indicated, although not conclusively, that hard-coal mining involved special risk of death from tuberculosis of the lungs. There was no doubt about an excessive mortality from respiratory diseases as a whole among both anthracite- and bituminous-coal miners. This excess, however, was greater in hard- than in soft-coal mining. The ratio of miners' proportionate mortality from respiratory diseases to that of other adult males in the general population was higher for anthracite than for bituminous miners at every age.

COURT DECISION RELATING TO PUBLIC HEALTH

Measure of damages for permanent injury to land caused by municipal septic tank.—(Texas Court of Civil Appeals; *Town of Merkel* v. *Patterson et al.*, 56 S.W. (2d) 941; decided Jan. 6, 1933.) An action was brought against a town to recover damages for permanent injury to plaintiffs' land by reason of the location and operation by the town of a septic tank in the vicinity of such land. A jury awarded damages in a specified amount and the town appealed.

One of the matters assigned as error by the town on appeal was an instruction given by the trial court, over objection by the town, regarding the damages, if any, recoverable by the plaintiffs. The instruction involved was as follows:

> In considering the amount of damages, if any, sustained by the plaintiffs, you will exclude from your consideration the mere fact that the sewer-disposal plant is established near the plaintiffs' land and will consider only the damages, if any, to plaintiffs' land necessarily caused by the operation of defendant's sewer-disposal plant and which defendant cannot avoid by using due diligence in the operation of said plant.

In its exceptions to the court's charge, the town had urged that the charge "does not limit the time of the plaintiffs' damages to any particular date or dates, giving no measure of damages whatever to guide a jury in finding the damages, if any, that plaintiff has sustained." The court of civil appeals stated that there was some conflict of decision as to the proper measure of damages for permanent injury to land but that the law was well established in Texas that

the rule of measurement was the difference in the value of the land immediately before and immediately after the injury. In sustaining the assignment of error, the appellate court said:

The issue as submitted is subject to practically the same criticism as that pointed out in the case last above cited, wherein it is stated: "It may be conceded that these issues on the measure of damages were incorrect in the form submitted in that the jury was authorized thereunder to consider the value of the land at any time prior to the injury and at any time subsequent thereto when it should have been instructed to confine its consideration as to market value to the time immediately preceding and immediately subsequent to the injury."

DEATHS DURING WEEK ENDED NOV. 4, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Nov. 4, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	7,905	7,184
Deaths per 1,000 population, annual basis	11 1	10. 3
Deaths under 1 year of age	579	527
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	50	44
Deaths per 1,000 population, annual basis, first 44 weeks of year	10. 8	11. 0
Data from industrial insurance companies:		
Policies in force	67, 497, 374	70, 018, 127
Number of death claims	12, 320	11, 733
Death claims per 1,000 policies in force, annual rate	9. 5	8. 8
Death claims per 1,000 policies, first 44 weeks of year, annual rate	9. 8	9. 5

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Nov. 11, 1933, and Nov. 12, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Nov. 11, 1933, and Nov. 12, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Nov. 11, 1933	Week ended Nov. 12, 1932	Week ended Nov 11, 1933	Week ended Nov. 12, 1932	Week ended Nov. 11, 1933	Week ended Nov. 12, 1932	Week ended Nov. 11, 1933	Week ended Nov 12, 1932
New England States:								
Maine	3				1		0	0
New Hampshire	1				1	1	0	0
Vermont	3	4			28		0	0
Massachusetts	19	33		3	97	44	1	4
Rhode Island	5	5			3	1	0	0
Connecticut	5	5	2		3	10	2	0
Middle Atlantic States:								
New York	43	57	[1] 27	[1] 15	251	239	3	4
New Jersey [2]	36	16	11	6	18	91	0	2
Pennsylvania	61	121			128	171	2	1
East North Central States:								
Ohio	120	119	93	93	50	114	1	3
Indiana	101	88	57	58	9	9	1	4
Illinois	49	108	20	21	18	48	5	6
Michigan	16	12	1	17	25	149	2	3
Wisconsin	13	9	18	28	38	136	0	1
West North Central States:								
Minnesota	8	14	1		16	64	0	1
Iowa [2]	23	19			1	2	2	0
Missouri [2]	85	93	8		23	18	2	1
North Dakota	10				31	157	0	0
South Dakota	8	1			64		0	0
Nebraska	7	33			2	1	0	1
Kansas	45	26		2	12	1	0	1
South Atlantic States:								
Delaware	1	2			2		0	0
Maryland [2 3]	31	16	5	3	1	3	0	0
District of Columbia	14	8	1	2	7		0	0
Virginia	92	57			43	43	0	1
West Virginia	98	39	63	5	28	33	2	0
North Carolina [3]	114	67	12	6	38	58	0	0
South Carolina	24	34	337	415	74	28	0	0
Georgia [3]	47	82			105		2	0
Florida	7	16		1		2	0	0
East South Central States:								
Kentucky	143	36	19	14	5	4	2	0
Tennessee	78	59	38	39	131	1	0	2
Alabama [3]	53	70	29	38	3	6	0	2
Mississippi [2]	38	33					0	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Nov. 11, 1933, and Nov. 12, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Nov. 11, 1933	Week ended Nov. 12, 1932	Week ended Nov. 11, 1933	Week ended Nov. 12, 1932	Week ended Nov. 11, 1933	Week ended Nov. 12, 1932	Week ended Nov. 11, 1933	Week ended Nov. 12, 1932
West South Central States:								
Arkansas	31	18	29	27	55	1	0	0
Louisiana	27	29	11	16	2	8	0	0
Oklahoma [4]	56	96	15	22	103	1	0	0
Texas [2 3]	244	249	133	106	13	6	0	0
Mountain States:								
Montana	3		3	6	1	85	0	0
Idaho	1	5			1		0	0
Wyoming					2		0	0
Colorado	4	4			6		0	0
New Mexico	3	25	5	38	15		1	10
Arizona	12	3	15	156	7	2	0	1
Utah [2]				26	94	1	0	0
Pacific States:								
Washington	2	6	1	3	34	10	0	0
Oregon	2	2	8	64	29	58	0	0
California	44	111	37	478	139	40	0	2
Total	1,828	1,830	999	1,708	1,757	1,616	28	51

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Nov. 11, 1933	Week ended Nov. 12, 1932	Week ended Nov. 11, 1933	Week ended Nov. 12, 1932	Week ended Nov. 11, 1933	Week ended Nov. 12, 1932	Week ended Nov. 11, 1933	Week ended Nov. 12, 1932
New England States:								
Maine	1	1	7	13	0	0	0	1
New Hampshire	0	0	25	18	0	0	0	0
Vermont	0	0	11	4	0	0	0	0
Massachusetts	2	2	107	215	0	0	0	4
Rhode Island	0	0	12	20	0	0	0	1
Connecticut	1	0	55	50	0	0	3	1
Middle Atlantic States:								
New York	13	4	323	357	0	0	19	8
New Jersey [2]	3	2	86	107	0	0	5	8
Pennsylvania	7	9	377	433	0	0	33	24
East North Central States:								
Ohio	9	3	528	543	0	39	17	10
Indiana	1	0	142	152	7	0	5	10
Illinois	1	6	69	341	0	2	16	14
Michigan	1	1	267	207	0	0	7	22
Wisconsin	4	1	83	71	27	1	9	1
West North Central States:								
Minnesota	4	1	39	61	7	0	4	1
Iowa [2]	3	1	80	36	0	4	1	2
Missouri [2]	1	1	121	133	4	0	3	8
North Dakota	1	0	26	1	0	0	1	0
South Dakota	3	0	9	4	1	0	9	1
Nebraska	0	2	35	32	0	1	0	1
Kansas	1	1	149	93	0	3	6	4
South Atlantic States:								
Delaware	0	0	2	2	0	0	3	2
Maryland [4 3]	3	1	107	61	0	0	12	11
District of Columbia	0	1	10	18	0	0	0	0
Virginia	1	0	130	91	1	1	17	13
West Virginia	1	1	188	73	3	0	36	19
North Carolina [4]	2	0	178	73	0	0	6	3
South Carolina	2	1	16	13	0	0	6	15
Georgia [3]	0	0	15	23	0	0	21	10
Florida	0	0	3	5	0	0	0	5
East South Central States:								
Kentucky	1	1	134	63	0	1	28	6
Tennessee	1	1	157	63	2	6	22	9
Alabama [3]	0	1	50	48	1	1	8	8
Mississippi [2]	0	0	33	31	6	2	7	8
West South Central States:								
Arkansas	0	0	49	13	2	5	2	9
Louisiana	0	1	17	15	1	0	14	6
Oklahoma [4]	1	1	37	40	1	1	22	8
Texas [2 3]	1	1	56	102	12	0	41	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Nov. 11, 1933, and Nov. 12, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Nov. 11, 1933	Week ended Nov. 12, 1932	Week ended Nov. 11, 1933	Week ended Nov. 12, 1932	Week ended Nov. 11, 1933	Week ended Nov. 12, 1932	Week ended Nov. 11, 1933	Week ended Nov. 12, 1932
Mountain States:								
Montana	0	0	9	15	0	0	4	7
Idaho	1	0	7	5	7	7	0	4
Wyoming	0	0	3	11	0	0	0	0
Colorado	0	0	28	28	11	0	7	2
New Mexico	0	0	15	7	0	0	9	8
Arizona	0	0	17	6	0	0	0	1
Utah [2]	0	0	10	3	0	1	0	0
Pacific States:								
Washington	4	1	25	39	5	4	3	0
Oregon	0	0	51	25	2	2	10	1
California	5	6	187	130	5	0	7	3
Total	79	52	4,087	3,896	105	81	118	285

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Nov. 11, 1933, 45 cases, as follows: Maryland, 1; North Carolina, 3; Georgia, 14; Alabama, 22; Texas, 5.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
October 1933										
Massachusetts	2	108		4	259		23	513	0	20
Missouri	3	414	11	15	14		6	442	6	43
New Jersey	3	79	41	1	59		39	329	0	29
North Dakota	1	35	5		8		13	42	0	6
Texas	7	701	345		13	45	2	210	19	194
Wyoming	1	2			4		3	34	1	4

October 1933	Cases
Anthrax:	
Massachusetts	[1] 1
New Jersey	1
Texas	3
Chicken pox:	
Massachusetts	280
Missouri	17
New Jersey	354
North Dakota	79
Texas	16
Wyoming	30
Dengue:	
Texas	11
Dysentery:	
Massachusetts	2
Missouri	8
Texas	53
German measles:	
Massachusetts	12
New Jersey	13
Hookworm disease:	
Wyoming	1
Impetigo contagiosa:	
Wyoming	1
Lead poisoning:	
Massachusetts	1
New Jersey	3

October 1933—Continued	Cases
Lethargic encephalitis:	
Massachusetts	1
Missouri	105
New Jersey	7
North Dakota	3
Texas	11
Mumps:	
Massachusetts	103
Missouri	15
New Jersey	69
North Dakota	1
Texas	17
Wyoming	4
Ophthalmia neonatorum:	
Massachusetts	77
New Jersey	1
Texas	2
Paratyphoid fever:	
Texas	7
Rabies in animals:	
Missouri	8
New Jersey	9
Septic sore throat:	
Massachusetts	5
Missouri	15
Wyoming	8

October 1933—Continued	Cases
Tetanus:	
Massachusetts	1
Missouri	1
Trachoma:	
Massachusetts	2
New Jersey	1
Texas	9
Trichinosis:	
Massachusetts	7
Tularaemia:	
Missouri	1
Texas	1
Typhus fever:	
Texas	24
Undulant fever:	
Texas	1
Vincent's angina:	
Wyoming	1
Whooping cough:	
Massachusetts	671
Missouri	115
New Jersey	458
North Dakota	40
Texas	168
Wyoming	7

[1] Case occurred in September.

WEEKLY REPORTS FROM CITIES

City reports for week ended Nov. 4, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	1	0	0	3	1	0	0	0	3	17
New Hampshire:											
Concord	0	------	0	0	0	0	0	1	0	0	9
Manchester	0	------	0	0	1	1	0	1	0	0	13
Nashua	0	------	0	0	0	11	0	0	0	1	0
Vermont:											
Barre	0	------	0	1	1	0	0	0	0	1	4
Burlington	0	------	0	0	0	0	0	0	0	3	7
Massachusetts:											
Boston	3	------	0	47	27	26	0	13	0	50	200
Fall River	4	------	0	0	1	1	0	0	0	9	31
Springfield	0	------	0	1	2	1	0	1	0	16	30
Worcester	1	2	0	36	2	3	0	1	0	20	60
Rhode Island:											
Pawtucket	0	------	0	0	0	0	0	0	0	0	14
Providence	0	------	0	0	6	4	0	1	0	15	59
Connecticut:											
Bridgeport	0	------	0	4	0	3	0	1	0	1	25
Hartford	1	------	0	0	2	7	0	0	0	0	34
New Haven	0	1	0	0	4	0	0	0	0	4	40
New York:											
Buffalo	4	------	0	21	12	12	0	5	0	0	133
New York	17	29	11	13	108	77	0	97	8	121	1,412
Rochester	3	------	0	0	3	5	0	1	0	8	56
Syracuse	0	------	0	0	1	1	0	1	0	42	37
New Jersey:											
Camden	2	------	0	0	0	9	0	3	0	1	36
Newark	1	6	0	0	7	17	0	6	0	20	93
Trenton	0	------	0	1	2	3	0	0	0	2	32
Pennsylvania:											
Philadelphia	7	6	2	33	20	53	0	25	4	37	483
Pittsburgh	8	1	1	0	12	25	0	8	0	33	161
Reading	0	------	0	1	4	1	0	1	0	9	25
Ohio:											
Cincinnati	4	------	1	3	7	27	0	8	0	3	127
Cleveland	13	45	1	0	5	56	0	11	0	51	160
Columbus	4	4	4	2	5	26	0	3	1	5	100
Toledo	2	------	0	0	6	22	0	4	0	0	61
Indiana:											
Fort Wayne	7	------	1	0	1	7	0	2	0	0	23
Indianapolis	3	------	0	2	11	21	0	4	0	13	------
South Bend	0	------	0	0	2	11	0	0	0	0	18
Terre Haute	0	------	0	4	1	4	0	1	0	0	15
Illinois:											
Chicago	2	3	4	5	40	128	0	35	3	68	602
Springfield	0	1	0	0	0	5	0	0	0	0	16
Michigan:											
Detroit	11	1	0	7	14	55	0	11	2	99	215
Flint	3	------	0	2	2	10	0	0	0	8	33
Grand Rapids	3	------	0	0	3	5	0	1	1	0	40
Wisconsin:											
Kenosha	0	------	0	0	0	10	0	0	0	6	3
Madison	0	------	------	2	------	1	0	------	0	24	13
Milwaukee	10	1	1	2	2	15	0	5	1	60	91
Racine	0	------	0	0	0	4	0	2	0	8	13
Superior	0	------	0	0	0	0	0	1	1	3	12
Minnesota:											
Duluth	0	------	0	0	4	2	0	0	1	0	18
Minneapolis	3	------	3	0	5	5	0	2	0	12	101
St. Paul	0	1	1	0	7	14	0	0	0	13	71
Iowa:											
Des Moines	0	------	------	0	------	22	0	------	1	0	29
Sioux City	1	------	------	0	------	7	0	------	0	0	------
Waterloo	1	------	------	0	------	1	0	------	0	2	------
Missouri:											
Kansas City	2	1	0	0	10	31	0	3	0	1	74
St. Joseph	1	------	0	0	3	5	0	0	1	0	16
St. Louis	12	1	0	3	8	19	0	5	3	13	221
North Dakota:											
Fargo	1	------	0	1	0	0	0	0	0	0	7
Grand Forks	0	------	0	0	0	0	0	0	0	1	0

City reports for week ended Nov. 4, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
South Dakota:											
Aberdeen	0	------	0	0	0	0	0	0	2	0	0
Sioux Falls	0	------	0	51	0	0	0	0	0	0	8
Nebraska:											
Omaha	2	------	0	0	7	12	3	1	0	3	58
Kansas:											
Topeka	0	------	0	0	0	7	0	0	0	2	1
Wichita	0	------	0	0	0	6	0	1	0	1	18
Delaware:											
Wilmington	0	------	0	0	3	1	0	1	1	2	23
Maryland:											
Baltimore	5	------	0	4	14	29	0	17	2	71	209
Cumberland	1	------	0	0	0	4	0	0	0	1	10
Frederick	0	------	0	0	0	0	0	0	0	0	3
District of Columbia:											
Washington	10	------	0	5	17	5	0	16	6	14	187
Virginia:											
Lynchburg	9	------	0	0	0	3	0	2	0	0	14
Richmond	3	------	0	0	5	6	0	0	0	0	46
Roanoke	2	------	0	0	0	13	0	0	0	0	10
West Virginia:											
Charleston	12	------	0	0	0	7	0	0	1	0	13
Huntington	7	------	0	1	0	13	0	0	0	0	0
Wheeling	0	------	0	0	3	7	0	0	0	1	12
North Carolina:											
Raleigh	0	------	0	3	2	10	0	0	0	0	15
Wilmington	0	------	0	0	0	0	0	1	0	0	6
Winston-Salem	8	------	0	15	2	13	1	0	0	1	14
South Carolina:											
Charleston	1	15	0	0	0	0	0	1	0	1	26
Columbia	0	------	0	0	5	0	0	1	0	0	22
Greenville	0	------	0	1	0	1	0	0	1	2	9
Georgia:											
Atlanta	9	9	3	1	6	5	0	7	0	6	89
Brunswick	0	------	0	1	1	0	0	0	0	0	4
Savannah	3	8	0	0	1	2	0	2	0	1	26
Florida:											
Miami	2	------	0	0	0	0	0	1	0	0	19
Tampa	0	------	0	0	1	1	0	0	0	0	17
Kentucky:											
Ashland	4	------	0	0	0	3	0	0	0	0	--------
Lexington	1	------	0	0	0	2	0	0	1	0	14
Louisville	24	2	0	0	6	16	0	2	0	3	95
Tennessee:											
Memphis	7	------	1	0	13	18	0	6	2	1	100
Nashville	7	------	1	0	1	7	0	2	0	0	50
Alabama:											
Birmingham	10	1	2	0	5	16	0	5	3	0	57
Mobile	1	------	0	0	0	1	0	2	0	0	21
Montgomery	1	2	--------	0	-------	6	0	-------	0	0	--------
Arkansas:											
Fort Smith	1	------	--------	0	-------	1	0	-------	0	0	--------
Little Rock	0	------	0	0	0	2	0	4	0	0	6
Louisiana:											
New Orleans	19	4	2	1	9	9	0	10	4	0	148
Shreveport	8	------	0	0	1	5	0	1	0	0	38
Texas:											
Dallas	38	------	0	0	3	9	2	1	0	0	61
Fort Worth	10	------	0	0	1	2	0	1	0	0	19
Galveston	1	------	0	0	0	3	0	1	0	0	12
Houston	15	------	1	0	5	1	1	4	0	0	47
San Antonio	1	------	0	0	1	3	0	3	2	0	30
Montana:											
Billings	0	------	0	0	0	1	0	0	0	0	6
Great Falls	0	------	0	0	1	0	0	0	0	0	7
Helena	0	------	0	0	0	0	0	0	0	0	5
Missoula	0	------	0	1	0	2	0	0	1	0	6
Colorado:											
Denver	3	27	1	0	9	16	2	5	0	24	87
Pueblo	1	------	0	0	1	1	0	0	1	2	12
New Mexico:											
Albuquerque	0	------	0	0	0	0	0	6	0	1	12
Utah:											
Salt Lake City	0	------	0	43	1	4	0	1	0	4	22
Nevada:											
Reno	0	------	0	0	0	0	0	0	0	0	6

City reports for week ended Nov. 4, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Washington:											
Seattle	0			1		8	0		0	29	
Spokane	0			18	2	3	0		0	0	28
Tacoma	0		0	0	2	1	0	2	0	7	33
Oregon:											
Portland	0		0	2	6	19	0	0	0	5	63
Salem	0	3	0	0	0	0	0	0	0	0	0
California:											
Los Angeles	17	17	1	7	6	63	6	18	2	44	272
Sacramento	1		0	3	2	6	0	3	0	1	23
San Francisco	6		0	1	8	12	0	11	1	24	169

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Vermont:			
Burlington	0	0	1
Massachusetts:			
Boston	1	1	1
Fall River	0	0	1
Connecticut:			
Bridgeport	0	0	1
New Haven	1	0	0
New York:			
New York	1	2	6
Pennsylvania:			
Philadelphia	0	1	0
Pittsburgh	0	0	1
Ohio:			
Cincinnati	0	0	1
Cleveland	0	1	2
Indiana:			
Indianapolis	1	0	0
Illinois:			
Chicago	5	1	2

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Wisconsin:			
Milwaukee	0	0	1
Superior	0	0	1
Minnesota:			
Minneapolis	0	0	4
Iowa:			
Sioux City	1	0	0
North Dakota:			
Fargo	0	0	1
Maryland:			
Baltimore	0	0	1
District of Columbia:			
Washington	3	2	0
Georgia:			
Atlanta	2	2	0
California:			
San Francisco	1	0	1

Lethargic encephalitis.—Cases: Trenton, N.J., 2; Philadelphia, 1; Pittsburgh, 1; Cleveland, 2; Springfield, Ill., 1; Grand Rapids, Mich., 1; St. Louis, 9; Washington, 1; Fort Worth, Tex., 1; Salt Lake City, 1.

Pellagra.—Cases: Atlanta, 2; Savannah, 1; Birmingham, 1; Montgomery, Ala., 1; San Francisco, 1.

Typhus fever.—Cases: Birmingham, 1; Mobile, 3; Montgomery, 3

FOREIGN AND INSULAR

CANADA

Provinces - Communicable diseases -Two weeks ended October 21, 1933. The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the two weeks ended October 21, 1933, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				1	3		1			5
Chicken pox		11		133	143	87	44	18	78	514
Diphtheria			6	49	17	25	3		1	101
Dysentery							1		2	3
Erysipelas				5	2	2		2	3	14
Influenza		17		1	25				4	47
Lethargic encephalitis					1		1			2
Measles				62	26		5		9	102
Mumps					45	8	20	2	63	138
Paratyphoid fever					5					5
Pneumonia		3			19		6		12	40
Poliomyelitis			1	9	5		5	2		22
Scarlet fever		19	1	160	105	36	14	12	62	409
Trachoma						1			2	3
Tuberculosis	2	2	4	95	77	9	9	4	35	237
Typhoid fever		5	7	147	35	5	2		2	203
Undulant fever					7					7
Whooping cough		12	2	183	181	69	82	12	49	590

Quebec Province -Communicable diseases—Two weeks ended November 4, 1933. —The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the two weeks ended November 4, 1933, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Poliomyelitis	8
Chicken pox	200	Puerperal septicemia	3
Diphtheria	86	Scarlet fever	200
Erysipelas	3	Tuberculosis	77
Influenza	1	Typhoid fever	77
Measles	51	Whooping cough	103

DENMARK

Communicable diseases—August 1933.—During the month of August 1933 cases of certain communicable diseases were reported in Denmark as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	5	Paratyphoid fever	25
Chicken pox	9	Poliomyelitis	106
Diphtheria and croup	110	Puerperal fever	20
Dysentery	180	Scabies	614
Epidemic encephalitis	5	Scarlet fever	267
Erysipelas	235	Syphilis	72
German measles	7	Tetanus (neonatorum)	1
Gonorrhea	1,021	Tetanus (traumatic)	2
Influenza	3,409	Typhoid fever	20
Malaria	12	Undulant fever (Bact. abort. Bang)	57
Measles	215	Whooping cough	794
Mumps	121		

JAMAICA

Communicable diseases—Four weeks ended November 4, 1933.—During the 4 weeks ended November 4, 1933, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox		15	Puerperal fever		1
Dysentery	11	10	Tuberculosis	27	64
Leprosy	1	2	Typhoid fever	10	65
Poliomyelitis	1	1			

PANAMA CANAL ZONE

Communicable diseases—July–September 1933.—During the months of July, August, and September 1933, certain communicable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	July		August		September	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chicken pox	16		19		11	
Diphtheria	17		8		8	2
Dysentery (amebic)	19	1	28	4	24	3
Leprosy					1	
Lethargic encephalitis					1	
Malaria	330	8	256	7	204	3
Measles	39		40	1	22	
Mumps	1		1		1	
Pneumonia		28		25		29
Poliomyelitis					1	
Scarlet fever	1					
Tuberculosis		31		23		27
Typhoid fever	4		5		2	
Typhus fever					1	
Whooping cough	5		4			

PUERTO RICO

Notifiable diseases—Four weeks ended November 4, 1933.—During the 4 weeks ended November 4, 1933, cases of certain notifiable diseases were reported in the municipalities of Puerto Rico, as follows:

Disease	Cases	Disease	Cases
Chicken pox	34	Pellagra	2
Diphtheria	70	Puerperal fever	4
Dysentery	131	Ringworm	10
Erysipelas	7	Syphilis	13
Filariasis	3	Tetanus	4
Influenza	134	Trachoma	55
Malaria	5,120	Tuberculosis	498
Measles	65	Typhoid fever	14
Mumps	90	Whooping cough	142
Ophthalmia neonatorum	6		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Apr. 2-29, 1933	Apr. 30-May 27, 1933	May 28-June 24, 1933	June 25-July 29, 1933	Week ended— August 1933: 5	12	19	26	September 1933: 2	9	16	23	30	October 1933: 7	14	21	28	Nov. 4, 1933
China:																			
Canton	C				1														
Hankow	C		2	1	2						1								
	D		1		1	1													
Swatow	C		2																
Tientsin	C				4														
India	C	11,095	8,201	3,517	6,851	1,540	1,785	2,376	1,994	2,901	2,576								
	D	5,655	4,091	1,555	3,047	584	736	1,012	905	1,315	1,166								
Bombay	C	1	2	1	6				1				1	4	1			3	
Calcutta	C	770	690	196	77	16	12	18	13	21	28	23	12	9	26	15	11	16	
Chittagong	C	16	21	7				1											
Colong	C	1																	
Madras Presidency	C				276	159	307	272	185	274	213	182	247						
	D				74	60	116	89	73	126	94	79	91						
Madras	C																	4	
	D																	1	
Moulmein	C			3															
Rangoon	C	1	1	1	2														
Vizagapatam	C		1		4												1		
Indo-China (see also table below):																			
Pnom-Penh	C		2	1															
Saigon and Cholon	C	4			8	2													
Philippine Islands: [1]																			
Antique Province	C																9	8	2
	D																6	10	1
Bohol Province	C		15	80		1								6	1	28	6	52	35
	D		12	38										3	1	12	3	31	21
Cebu Province	C			2	90	4	14	6	2	1	9	6	11	12	22	16	15	10	23
	D			2	39	5	8	7		1	7	4	9	7	14	9	9	4	16
Cebu	C			1				1		1		1	2	5	6	6	3	6	1
	D			1				1		1		1	2	3	2	3	1	2	1

[1] During the week ended Nov. 11, 1933, cholera was reported in the Philippine Islands as follows: Bohol Province—Clarin, 7 cases, 4 deaths; Inabanga, 10 cases, 7 deaths, Mabini, 9 cases; Tubigon, 4 cases, 2 deaths; Ubay, 1 case, 1 death. Cebu Province—Argao, 1 case, 1 death; Carcar, 4 cases, 3 deaths; Cebu City, 11 cases, 6 deaths; Malubuyog, 1 death; Naga, 1 case, 1 death Talisay, 1 case. For the period Oct. 1 to 30, 1933, 20 cases of cholera with 14 deaths were reported in Gandara, Samar Province.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

[C indicates cases; D, deaths; P, present]

Place		Apr. 2-29, 1933	Apr. 30-May 27, 1933	May 28-June 24, 1933	June 25-July 29, 1933	Week ended— August 1933: 5	12	19	26	September 1933: 2	9	16	23	30	October 1933: 7	14	21	28	Nov. 4, 1933
Philippine Islands—Continued.																			
Iloilo Province—Iloilo	C		1		1														1
	D		1		1														2
Leyte Province	C	50	22	2				2			1								
	D	46	20	2				2			1								
Occidental Negros Province	C			19	6			1					1						
	D			9	7			1					1						
Pampanga Province	C		1																
	D		1																
Rizal Province	C		1																
Samar Province [2]	C	67	29	7				16	15										
	D	50	23	5				11	9										
Siam:																			
Bangkok	C		1	1															
Provinces	C	1	13	28	1														
	D		6	14	1														
On vessels:																			
S.S. Dunana at Madras	D		1																
S.S. Lauterfels at Calcutta	C		1																
S.S. Mathura at Calcutta	C		1																

Place		April 1933: 1-10	11-20	21-30	May 1933: 1-10	11-20	21-31	June 1933: 1-10	11-20	21-30	July 1933: 1-10	11-20	21-31	August 1933: 1-10	11-20	21-31	September 1933: 1-10	11-20	21-30
Indo-China (French) (see also table above):																			
Cambodia [3]	C	5		4	11	14	17	23	31	14	3	1			1				
	D	5		2	8	10	9	12	17	6	3	1			1				
Cochin-China [3]	C	2	7	1	5	9	6	4	8	5	6	2	12	3	2	1	1	2	2
	D	2	7	1	4	8	6	4	5	4	5	2	3	3	2	1	1	2	2

[2] For the period Sept. 10 to Oct. 8, 1933, 42 cases of cholera with 28 deaths were reported in Samar Province, Philippine Islands.

[3] Reports incomplete.

PLAGUE[1]

[C indicates cases; D, deaths; P, present]

Place		Apr. 2-29, 1933	Apr. 30-May 27, 1933	May 28-June 24, 1933	June 25-July 29, 1933	Week ended— August 1933: 5	12	19	26	September 1933: 2	9	16	23	30	October 1933: 7	14	21	28
Argentina:[2]																		
Cordoba Province	C	1	8															
San Luis Province	C	7																
Azores:																		
Fayal	C												1					
St. Michaels	C												7					
	D												1					
Belgian Congo	C	P																
Bolivia. (See table below.)																		
British East Africa (see also table below):																		
Kenya	C			3	7	2		1	10	2	6	3	10	9	16			
Tanganyika	D		1															
Uganda	C	48	85	53	58	21	20	19	17	18	34	22	21	18				
	D	48	83	53	58	21	20	19	17	13	28	23	23	17				
Ceylon: Colombo	C	1		1	2						1						1	
	D			1	2						1						1	
Plague-infected rats					4	1												
China: Manchuria.[3]																		
Dutch East Indies: West Java	C	949	878	793	1,434	276	287		336									
	D	948	872	789	1,428	276	286		336									
Ecuador. (See table below.)																		
Egypt:																		
Alexandria	C	1			4	1												
Asyut	C	11	10	2														
Aswan	C	3	1															
Faiyum	C			2	4						1	1			1			
	D				1													
Gharbiya	C													3	1			1
	D													2	1	1		1
Girga	C				2													

[1] Including plague in the United States and its possessions.
[2] For the month of July 1933, 7 cases of plague with 3 deaths were reported in El Mollar, Salta Province, Argentina.
[3] A report dated Oct. 9, 1933, states that from the beginning of the outbreak of plague in Manchuria up to the end of September 1933, 220 cases of pneumonic plague with 169 deaths occurred in the vicinity of Tungliao, 19 deaths from bubonic plague in the Taonan area, and 604 cases with 296 deaths from bubonic plague occurred in the Nungan area.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Apr. 2–29, 1933	Apr. 30–May 27, 1933	May 28–June 24, 1933	June 25–July 29, 1933	Week ended— August 1933: 5	12	19	26	September 1933: 2	9	16	23	30	October 1933: 7	14	21	28
Egypt—Continued.																		
Minufiya	C	1	1															
Minya	C			4	1									1				
Qena	C							1										
	D							1										
Luxor	C						1	1										
France: Marseille	C						8											
	D						3											
Plague-infected rats							2											
Hawaii Territory: Hawaii Island—Hamakua—Plague-infected rats											1							
India	C	3,227	2,319	1,411	3,869	1,072	936	2,020	2,181	2,151	2,350							
	D	2,042	1,407	1,231	2,616	571	618	1,208	1,163	1,331	1,369							
Bassein	C	13	3	1	11	1	4		2			2		1				
Plague-infected rats		1	3	2	2		1											
Bombay Presidency	C				2,448	780	565	1,035	1,591	1,263	1,424	1,465	1,872					
	D				1,493	450	369	619	875	852	898	967	1,173					
Bombay	C	10	6	2	1		1			2	1	1	2	1	1	1		1
Plague-infected rats		103	34	16	5	2	2		1			1		2	1			
Poona	C														176			
	D														118			
Madras Presidency	C	27	23	8	372	116	162	306	283	253	190	183	273					
	D	14	8	6	148	42	64	126	163	136	77	83	111					
Rangoon	C		1	1								2			1			
Plague-infected rats					3			1						2				
Indo-China (see also table below):																		
Pnom-Penh	D	3	6	3	2		1	1	1	2					2			
Saigon and Cholon	C	4	2		2	2		1										
Plague-infected rats			3															
Iraq:																		
Baghdad	C		3	2	7					1	1		1			[1] 1		
Basra	C				3													
Libya: Gheran	C													10				
	D													3				

Madagascar: Tamatave	C						1											
Morocco	C	28	2		8													
Peru. (See table below.)																		
Senegal. (See table below.)																		
Siam:																		
Bangkok	C	2																
Provinces	C			2														
South-West Africa.[5]																		
Straits Settlements: Singapore	C	2																
Syria: Beirut	C	1		1	2													
Union of South Africa: Orange Free State	C		7															
United States: California:																		
San Benito County—Plague-infected ground squirrels						7		1										
Whittier	C						1											
	D						1											

Place		April 1933	May 1933	June 1933	July 1933	August 1933	September 1933
Bolivia	C				25	1	
British East Africa (see also table above):							
Kenya	C	6	4	6	3	13	36
Ecuador	C		35				3
Indo-China (see also table above):							
Cambodia	D	6	3	5	3	6	16
Cochin-China	C	5	2		2	5	
Peru	C	2	3	5	6	7	8
Senegal:							
Dakar [6]	C	1	2		57		
	D	1	1		39		
Tivaouane [6]	C	1		1		5	

[4] Imported.
[5] 87 cases of plague with 5 deaths were reported in Ovamboland, South-West Africa from Jan. 1 to Aug. 26, 1933. Antiplague measures have been taken.
[6] Incomplete reports.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Apr. 2–29, 1933	Apr. 30–May 27, 1933	May 28–June 24, 1933	June 25–July 29, 1933	Week ended— August 1933: 5	12	19	26	September 1933: 2	9	16	23	30	October 1933: 7	14	21	28	Nov. 4, 1933
Algeria:																			
Algiers Department	C				2														
Constantine Department	C				1														
Arabia: Muscat—Oman Sultanate	C			73															
	D			20															
Belgian Congo	C				5					2	2								
	D				1														
Bolivia. (See table below.)																			
Brazil: Porto Alegre (alastrim)	C			6	1			1			1								
British East Africa:																			
Kenya	C	13	4																
Tanganyika	C	17	13	10	6	15	1		5	9		16	2	3					
British South Africa:																			
Northern Rhodesia	C		2		1				1										
Southern Rhodesia	C	8	16		1							2							
Canada:																			
British Columbia	C	[1]6	[1]1	[1]1															
Manitoba	C								1										
Ontario	C		[1]1	[1]1															
Toronto	C	[1]3	1																
Saskatchewan	C	[1]2	[1]5	7							[1]1								
Ceylon:																			
Colombo	C	2	4	9	6		7	1	1										
Galle	C	46	2		1														
China:																			
Amoy	C	3	3	2															
Canton	C	50	7																
	D	2																	
Dairen	C	1	3	2	3						1								
Foochow	C	P	P	P	P														
Hangchow	C				3	1													
	D				2	1													
Hong Kong	C	84	19	8	3			1											
Macao	C	4	4																
Nanking	C	2	2	2	2														
Shanghai	C	39	33	27	22	5	3	1	1	2		1	1	1	2			1	

Swatow	C	16	10	4															
Tientsin	C			16	2														
Chosen. (See table below.)																			
Colombia: Buenaventura	D				1														
Dahomey. (See table below.)																			
Ecuador. (See table below.)																			
Egypt:																			
Alexandria	C	42	11																[1] 1
Asyut	C				112	14		40	55			17		26	6				
	D				23	3		4	4			3		3	1				
Beheira	C	114	62	6															
Beni-Suef	C											10	17	4	10				
	D											4	1	2	1				
Cairo	C	10	10	4	1									1					
Dakahliya	C				4			1											
Faiyum	C				44	10	3	3	2			2		1	1				
Gharbiya	C	88	93	142	83	8	1	27	3	4		1							
Girga	C				2		1		1										
Minufiya	C	37	128	26															
Port Said	C	3																	
Qena	C				9	14	4		7			3	1						
Provinces	C	309	347	287	499	50	80	89	78	50	32	33		35	18	12			
France. (See table below.)																			
Great Britain:																			
England and Wales	C	98	91	71	55	10	5	9	8	4	2	6	4	4	3	3			
London	C	75	79	51	40	9	4	7	8	3		5	3	3	3	3			
London and Great Towns	C	85	82	56	49	9	5	9	8	3	1	5	3	3	3	3			
Greece (see also table below): Salonika	C		18		8								9						
Guatemala. (See table below.)																			
Honduras:																			
Tegucigalpa	C	1	7	3															
Tela	C	1																	
India	C	40, 379	33, 876	23, 631	14, 599	1, 953	1, 799	1, 774	1, 543	1, 765	1, 509								
	D	10, 288	9, 706	7, 008	4, 256	538	440	373	417	430	345								
Bassein	C	57	32	16	9	3	4	1	2	4	1	4	7	3	3	3	2	4	
	D	14	11	11	8	2	4			3	1		1	1	3		2	2	
Bombay	C	510	212	88	34	7	3	1	3	1					2		1	1	
	D	286	148	58	25	4	2		2	1					2		1	1	
Calcutta	C	921	342	134	59	4	6	2	6	4	2	2	2		1	3		4	
	D	745	289	107	49	3	4	1		2			1		1	1		1	
Chittagong	C		1																
	D		1																
Cochin	C	5		2	4					2								1	
Karachi	C	130	52	19	16	1	3	1											
Madras	C	496	231	144	234	45	37	79	62	63	33	32	36	45	30	22	13	16	
Moulmein	C			12															
Negapatam	C	6	7	3	12	2	4	3	12	2	2	3		1		1	4	4	
Rangoon	C	15	17	6	4			1		1		3			1				
Tuticorin	C	1				2												1	
Vizagapatam	C	4	2	5	14	7		3	1				2			1			

[1] For 2 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Apr. 2-29, 1933	Apr. 30-May 27, 1933	May 28-June 24, 1933	June 25-July 29, 1933	Week ended— August 1933: 5	12	19	26	September 1933: 2	9	16	23	30	October 1933: 7	14	21	28	Nov. 4, 1933
India (French):																			
Chandernagor	D				1														
Karikal	C			5															
	D			5															
Pondichery	C			129	139	46		42	93	57	50	40	24						
	D			82	73	29		23	18	22	25	17	22						
Indo-China (see also table below): Saigon and Cholon	C	2			1						1								
Iraq:																			
Baghdad	C	2	5												1				3
Basra	C		6	2						4									
Japan:																			
Kobe	C				1														
Osaka	C	8	1																
Tokyo	C	6	1	2	45														
Yokohama	C	3																	
Mexico (see also table below):																			
Coahuila	C		1	2															
Juarez	C	5	2																
Mexico, D.F.	C	11	5	5	1	12													
Monterrey	D		2						1										1
Saltillo	D	1	2	3															
San Luis Potosi	D	1	5	1	9	3	1	3	1										
Torreon	D													1		1			
Morocco. (See table below.)																			
Nigeria	C	1,261			675			361											
Nyasaland. (See table below.)																			
Palestine	C				13														
Paraguay: Asuncion	D				3														
Persia	C	54	89	31	26			12	8				5	5		8			
	D	23	62	62	9			4	3				6	1		2			
Teheran	C				21	4	7	5	1	2			1			2			
	D				8	2	1	1	1				1						
Peru. (See table below.)																			
Poland	C		2	1	1														
Portugal:																			
Lisbon	C	2	2	3	5			1	2			2	1						
Oporto	C		2		3		1										2		

Siam	D				5	1													
Sierra Leone	C	22	51	6	45	3		[1] 3		[1] 200		[1] 50							
Spain	C				59		29			11	5				4	7			
Sudan (Anglo-Egyptian)	C	18	5	1	5						1								
Syria:																			
Beirut	C	2	1	6	14	5		16											
Provinces	C	40	20	4	9	1	1		9	1			3	3	16			18	
Turkey. (See table below.)																			
Union of South Africa:																			
Cape Province	C		P																
Orange Free State	C	P		P															
On vessels:																			
S.S. City of Nagpur at Karachi	C	1																	
S.S. Rajputana at Aden	C		1																
	D		1																
S.S. Baron Inchcape at Hong Kong	C		P																
S.S. Fernmoor at Vancouver	C			4															
S.S. Egra at Rangoon from Calcutta	C		1																
S.S. Arracan at Newport	C					1													
S.S. Clan Macquarrie at Suez	C									1									
S.S. Sikh at Madras	C								1										
S.S. Lichtenfels at Suez from Calcutta	C													1					
S.S. Shahjehan at Madras	C											1							

Place		April 1933	May 1933			June 1933			July 1933			August 1933			September 1933	
			1–10	11–20	21–31	1–10	11–20	21–30	1–10	11–20	21–31	1–10	11–20	21–31	1–10	11–20
Dahomey	C	26	2	9		1	1		2	1		6	1	1	20	6
	D	1		2			1		1				1	1	5	1
Indo-China (see also table above)	C	429	58	48	43	60	83	54	74		31	20	38	21		44
	D	111	21	14	10	16	36	24	31		6	5	15	3		19

Place		April 1933	May 1933	June 1933	July 1933	August 1933	September 1933
Bolivia	C	21	28	12	10		15
Chosen	C	4	34		3		
	D	2	14				
Ecuador	C		[2] 1				
France	C	15	21				
Greece	C	6				1	
Guatemala	C	3	1				
Mexico (see also table above)	C				9	31	
Morocco	C	23	14	10	8	1	2
Nyasaland	C	393	303	248	336		
Peru	C	5	6		84	56	
Turkey	C	3		13		8	56

[1] For two weeks.

[2] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Apr. 2-29, 1933	Apr. 30-May 27, 1933	May 28-June 24, 1933	Week ended— July 1933: 1	8	15	22	29	August 1933: 5	12	19	26	September 1933: 2	9	16	23	30	October 1933: 7	14
Algeria:																				
Algiers Department	C	2	14	11	1		1	2	3	1	1									1
Constantine Department	C	219	120	157	18	20	3	14	11	3	8		10	2	4	5	1	4	1	
Bone	C	3	2						1		1									
Oran Department	C			1	1	1									2					
Basutoland. (See table below.)																				
Bolivia. (See table below.)																				
British East Africa: Uganda	C		10	7	1	3					2		2	3	1	5	2			
Bulgaria	C	9	8	4		1		1			2	1					1			
Chile	C	137										596	432							
Antofagasta	C	1		1																
Santiago	C		134	290	72	141	216	221	462	392				124	282	233	218	214		
Valparaiso	C			1		1		4	2			8	5	5	8	11		10	4	8
China:																				
Hangchow	C									5										
Hankow	C																	1		
Harbin	C											8	3							
Nanking	C					1					1									
Shanghai	C					1							1				1			
Tientsin	C					1														
Chosen. (See table below.)																				
Czechoslovakia. (See table below.)																				
Egypt:																				
Alexandria	C	6	24	17	9	2	3	1	3	1					1					
Beheira	C	443	560	569	42	108	46	41	20	16	21	14	10	7	3	2	4	2	8	
Cairo	C	42	53	28	1	1	3	2	2	2	1		1				1			
Dakahliya	C	231	267	140	43	17	11	5	6	8	10	19	5	7	2	1	1	3		
Damietta	C			3		1	2						1	1						
Gharbiya	C	331	448	591	97	53	75	56	29	22	10	19	28	11	10	8	9	3		
Minufiya	C					7	20	12	13	4	20	4	8	1	1	2		2	3	
Provinces	C	1,245	1,611	1,591	242	199	161	115	68	54	63	56	53	29	22	17	25	14	13	12
Greece. (See table below.)																				
Guatemala. (See table below.)																				
Hungary	C	14	15	11																

Iraq: Baghdad	C	1	2	2			1		1		1									
Irish Free State:																				
Kerry County—Dingle	C																			4
Waterford County—Lismore	C										1									
Latvia. (See table below.)																				
Lithuania	C	27	31	15		1					8	2	1							
Mexico (see also table below):																				
Mexico, D.F	C	4	15	9		2	1	2	1		1			2						
San Luis Potosi	D																	1		
Torreon	C											1			1	1				
Morocco	C	17	31	63		4		8	2	1	11			1	1				1	1
Palestine	C	3		1	18		1		1		2		1	1	1			1		
Persia	C	69	39	25	6		2	8	5	9	4	2		4	1	3	6	10	8	5
Peru. (See table below.)																				
Poland	C	355	378	322	61	44	38	20	33	27	19	3	7	6	8	12	8	17	17	8
	D	24	21	13	3	2	2	1	3	4		1	1				1		2	1
Rumania. (See table below.)																				
Spain: Madrid	C														1		1		1	
	D															1				
Syria	C		24	21	1						1		1							
Trans-Jordan	C	8	17	4			1	1												
Tunisia:																				
Tunis	C	1														1				2
Provinces	C	52	42	65		20	6	10												
Turkey (see also table below): Istanbul	C	1																		
Union of Socialist Soviet Republics. (See table below.)																				
Union of South Africa. (See table below.)																				
Yugoslavia. (See table below.)																				
On vessels:																				
S.S. Chiloe at Antofagasta	C			1																
S.S. Conte Verde at Bombay from Singapore	C		1																	

Place		April 1933	May 1933	June 1933	July 1933	August 1933	September 1933
Basutoland	C	93	233		208	279	
Bolivia	C	190	98	71	36		
Chosen	C				59		
Czechoslovakia	C	32	31	9	6	1	
Greece	C	3	12	6	5	4	
Guatemala	C	14	8	3	1	4	5
Latvia	C					1	
Mexico (see also table above)	C				12	19	
Peru	C	21	28	23	20	60	

Place		April 1933	May 1933	June 1933	July 1933	August 1933	September 1933
Rumania	C				57	22	13
Turkey (see also table above)	C	12	16	13	5	7	9
Union of Socialist Soviet Republics	C		2,051				
Union of South Africa:							
Cape Province	C	130	189	124	195	135	
Natal	C	8	6	122	23	18	
Orange Free State	C	45	15	34	61	140	
Transvaal	C	1	1	7	5	3	
Yugoslavia	C			136	89	33	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		Apr. 2–29, 1933	Apr. 30–May 27, 1933	May 28–June 24, 1933	Week ended—														
					July 1933					August 1933				September 1933					Oct. 7, 1933
					1	8	15	22	29	5	12	19	26	2	9	16	23	30	
Brazil:																			
Ceara State:																			
Lavras	C			1															
	D			1															
Limoeiro	C	1																	
	D	1																	
St. Matheus	C			1															
	D			1															
Pernambuco State:																			
Granito	C							2											
	D							2											
Novo Exu [1]	C						1												
	D						1												
Salgueiro	C		1																
	D		1																
French West Africa:																			
Guinea	C															[2] 1			
Niger Territory	C												2	1				2	1
	D												2						[3] 2
Gold Coast [4]	C		2	1											[2] 1				
	D														[2] 1				
Ivory Coast:																			
Bouafle	C			1															
Gagnoa	C			[2] 1															
	D			1															
Senegal:																			
Bakel	C																2		
St. Louis	D					[5] 1													

[1] 2 cases of yellow fever with 2 deaths were reported in Novo Exu, Pernambuco State, Brazil, during the month of June 1933.
[2] Suspected.
[3] Includes 1 suspected death.
[4] 1 case of yellow fever with 1 death was reported at Sokoto, Gold Coast, Nov. 10, 1933.
[5] Imported.

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Deaths in Large Cities During Week Ended November 11
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 48 DECEMBER 1, 1933 NO. 48

METHYLENE BLUE IN THE TREATMENT OF HCN GAS POISONING

By J. A. TRAUTMAN, *Passed Assistant Surgeon, United States Public Health Service*

Recently, the intravenous injection of a solution of methylene blue has been advocated as a treatment for cyanide poisoning. In view of the extensive use of HCN gas in the fumigation of ships, this development has been of extreme interest to the United States Public Health Service. Since, however, the problem presented in fumigation accidents from inhalation of HCN gas differs from that presented when cyanides are ingested, the experimental work reported herein has been undertaken. Brooks has shown that if rats were made unconscious by inhalation of HCN, their rate of recovery could be accelerated considerably by intraperitoneal injection of 1 percent methylene blue solution. We have attempted, in our experiments, to study the problem as it is encountered in fumigation work, and have subjected animals to conditions comparable to exposures to gas in fumigation. The object of these experiments, therefore, was to determine the value of methylene blue injections in the treatment of animals poisoned by inhalation of lethal, or near-lethal, doses of HCN gas.

It has been the almost universal observation of experienced fumigators that persons overcome with HCN gas either die very quickly or, when removed to the open air, recover within a relatively short period of time and recover completely. This is logical because, when inhaled, the poison is immediately absorbed into the blood stream and, in consequence, immediately exerts its effects. Conversely, when the victim is removed to the open air, absorption of additional poison stops at once and that in the blood begins to pass off by way of the lungs. If a large dose has been absorbed, the victim is usually dead when removed from the gas, but when a sublethal dose has been absorbed, the progress of poisoning stops at once and the process of recovery begins. The border-line cases are those in which sufficient HCN gas has been absorbed to inhibit respiration and prevent its spontaneous return, but not sufficient completely to inhibit other body functions, so that if artificial respiration is resorted to, a sufficient amount of the gas may be removed through aeration of the lungs to relieve the effect on the respiratory center, which is followed by

resumption of breathing and recovery. It appears that if methylene blue is of value, it would be in the border-line cases.

Animals differ somewhat from man in their reactions to HCN gas, and, for that reason, a preliminary study was made of a considerable number of guinea pigs, white rats, and rabbits exposed to this gas, with the object of determining the point at which the animal had received a near-lethal, or lethal, dose. The success of the experiments necessarily depended on the animals' receiving, in each case, a uniform dosage—that is, insofar as the dosage was at the near-lethal, or lethal, point. After considerable study it was found possible to determine when the animal had received a lethal, or near-lethal, dose. In the case of rabbits, it was found possible to expose them to gas to the point where they stopped breathing and subsequently recovered; but prolonging the exposure to more than about 10 seconds after cessation of breathing always resulted in death. Guinea pigs and white rats reacted somewhat differently. It was not possible to keep them in the gas to the point of cessation of breathing because, once respiration had ceased, death invariably resulted regardless of whether or not they received injections of methylene blue.

It was necessary in these two groups of animals, therefore, to study the character of the respiration as a means of determining the lethal, or near-lethal, point of gas dosage. These points are, naturally, not definitely determinable, but for practical purposes they were believed to be satisfactory. Of course we were not able to approximate the amount of HCN gas absorbed by the animals, but we have rather studied results of exposure to definite concentrations of gas, with the hope that more practical results would be thus obtained than would be obtained in using definite amounts of other cyanides by intravenous or oral administration. It will be noted in the tables in this paper that the writer's observation as to lethal and near-lethal dosages could not have been much in error.

The concentrations of HCN gas used in these experiments were ½ ounce per 1,000 cubic feet for rabbits, and 1 ounce per 1,000 cubic feet for white rats and guinea pigs.

PROCEDURE OF EXPERIMENTS

The animals were placed separately in glass jars which were of such size that $\frac{1}{10}$ cc of liquid HCN gave a concentration of gas equal to 1 ounce per 1,000 cubic feet. The jars were covered with oiled paper, which was fastened snugly with a cord around the top of the jar. A small hole was made in the paper near the edge of the jar. Liquid HCN was measured out in a pipette in the amount desired, and the pipette was then inserted into the small hole in the covering. The liquid HCN was allowed to run down the edge of the jar so that it

would rapidly be transformed into a gas and so that the animal would not come in direct contact with the liquid.

As soon as the liquid had been poured into the jar, the hole in the cover was closed. The time of insertion of the liquid was noted, and the animal was observed until it was thought that it had breathed in a near-lethal, or lethal, dose of the HCN gas. The animal was then quickly removed from the jar, and a 1 percent solution of methylene blue in physiological saline solution was injected intravenously in rabbits at a dosage of 1 cc per kilogram of body weight, and intraperitoneally in guinea pigs at a dosage of 1 cc per 100 grams of body weight. In the experiments with white rats, methylene blue was injected intraperitoneally in two dosages, the first series receiving dosages of 1 cc per 100 grams of body weight, the second series receiving dosages of ½ cc per 100 grams of body weight.

The animals were observed to determine the time of recovery or the time in which death took place. The recovery time or the death time was estimated from the time the animal was taken from the jar until it had recovered or died. Recovery was considered complete when the animal had regained the use of its legs and was able to move forward. An equal number of control experiments were conducted.

Fifty-four guinea pigs were exposed to HCN gas in a concentration equal to 1 ounce per 1,000 cubic feet. Of 29 that were given intraperitoneal injections of methylene blue solution, 17 recovered and 12 died. The average time of exposure for the 17 that recovered was 5 minutes 15 seconds, and the average time of recovery was 12 minutes 27 seconds. Of the 12 guinea pigs that died, the average exposure time was 5 minutes 11 seconds, and the average time in which death occurred was 6 minutes 1 second. Fifteen of the 25 guinea pigs that did not receive injections of methylene blue recovered; their average time of exposure was 5 minutes 50 seconds, and the average time of recovery 13 minutes 10 seconds. The average time of exposure for the 10 guinea pigs that died was 5 minutes 45 seconds, and the average time of death 6 minutes 54 seconds.

Ninety-eight white rats were exposed to HCN gas in a concentration equal to ½ ounce per 1,000 cubic feet. Of this number, 66 were given intraperitoneal injections of methylene blue. Thirty-two of these were given the solution in a dosage of 1 cc per 100 grams of body weight. Twenty recovered. The average time of exposure was 3 minutes 38 seconds, and the average time of recovery 13 minutes 46 seconds. The average exposure time of the 12 rats that died was 3 minutes 27 seconds, and the average time in which death occurred was 2 minutes 54 seconds. The other 34 white rats received injections of methylene blue in a dosage of ½ cc per 100 grams of body weight. Twenty-three recovered, with an average recovery time of 13 minutes 52 seconds; the average time of exposure was 3

minutes 22 seconds. The remaining 11 rats died; their average time of exposure was 3 minutes 13 seconds, and the average time in which death took place 2 minutes 30 seconds. Thirty-two rats were used as controls. They were exposed to HCN gas in a concentration equal to ½ ounce per 1,000 cubic feet and were not given injections of methylene blue. Twenty-two of these recovered and 10 died. The average time of exposure for those that recovered was 3 minutes 40 seconds, and the average time of recovery 13 minutes 34 seconds. For those that died, the average time of exposure was 3 minutes 16 seconds, and the average time in which death occurred was 2 minutes 38 seconds.

Thirty-five rabbits were exposed to HCN gas in a concentration equal to ½ ounce per 1,000 cubic feet. Of this number, 18 received injections of methylene blue and 17 were used as controls. The rabbits received intravenous injections of methylene blue solution in a dosage of 1 cc per kilogram of body weight. Fifteen of them recovered and three died. The average exposure time of those recovering was 2 minutes 59 seconds, and the average time of recovery 13 minutes 6 seconds. Of the 17 receiving no methylene blue, 15 recovered and 2 died. The average exposure time for those recovering was 3 minutes 2 seconds, and the average recovery time 12 minutes 55 seconds. For the 5 rabbits that died, the average exposure time was 3 minutes, and average time of death 2 minutes 46 seconds, there appearing only slight individual variations.

These results are tabulated in table 1.

TABLE 1.—*Results of experiments*

Animal group	Number in group	Number that died	Average time of exposure	Average time of death	Number that recovered	Average time of exposure	Average time of recovery
WHITE RATS							
Given methylene blue, 1 cc per 100 gm, intraperitoneally.	32	12	3 min. 27 sec.	2 min. 54 sec.	20	3 min. 38 sec	13 min. 46 sec.
Given methylene blue, ½ cc per 100 gm.	34	11	3 min. 13 sec.	2 min. 30 sec.	23	3 min. 22 sec	13 min. 52 sec.
Controls, receiving no methylene blue.	32	10	3 min. 16 sec.	2 min. 38 sec.	22	3 min. 40 sec.	13 min. 34 sec.
GUINEA PIGS							
Given methylene blue, 1 cc per 100 gm, intraperitoneally.	29	12	5 min. 11 sec.	6 min. 1 sec.	17	5 min. 15 sec	12 min. 27 sec.
Controls, receiving no methylene blue.	25	10	5 min. 45 sec.	6 min. 54 sec.	15	5 min. 50 sec.	13 min. 10 sec.
RABBITS							
Given methylene blue, 1 cc per kg., intravenously.	18	3	3 min. 0 sec.[1]	2 min. 46 sec.[1]	15	2 min. 59 sec.	13 min. 6 sec.
Controls, receiving no methylene blue.	17	2	3 min. 0 sec.[1]	2 min. 46 sec.[1]	15	3 min. 2 sec.	12 min. 55 sec.

[1] Average time for the 5 rabbits that died; only slight individual variations were noted.

CONCLUSIONS

It was apparent from these experiments on rabbits, white rats, and guinea pigs that injections of 1 percent methylene blue solution were of no value in the treatment of hydrocyanic acid gas poisoning where the animals had absorbed, by breathing, lethal or near-lethal doses of gas in a short period of time. There was a slight variation of results in the different animals used, but the average of results indicated no advantage in favor of methylene blue treated animals.

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MORTALITY FROM CERTAIN CAUSES DURING THE FIRST HALF OF 1933 [1]

This report covers mortality in 28 States for the first half of 1933, with comparative data for the first half of the four preceding years. In addition to the death rate from all causes, rates are shown for 4 groups of diseases and 17 specific causes, some of which are included in the groups. Infant and maternal mortality rates per 1,000 live births are also shown.

The rates are computed from current and generally preliminary reports furnished by State departments of health. Because of some lack of uniformity in the method of classifying deaths according to cause, some delayed death certificates, and various other reasons, these preliminary rates cannot be expected to agree in all instances with final rates published by the Bureau of the Census, which are based on a complete review and retabulation of the individual death certificates from each State. The preliminary rates given in the accompanying table are intended to serve only as a current index of mortality until final figures are issued by the Bureau of the Census.

The mortality situation for the first half of 1933 is very favorable. The death rate from all causes in the whole group of 25 States [2] was 11.1 per 1,000, as compared to 11.3 and 11.8 in the first half of 1932 and 1931, respectively. Both the first and second quarters show a decline. Of the 28 States with data for both 1933 and 1932, 13 States, with an aggregate population of 35,000,000, had higher rates

[1] From the Office of Statistical Investigations, United States Public Health Service.
[2] States with data for every cause group included in the table for each of the years 1931, 1932, and 1933.

in 1933; 12 States, with an aggregate population of 51,000,000 had lower; and in 3 States, with an aggregate population of 9,000,000 the rate remained the same.

Tuberculosis mortality was 60.2 per 100,000 in the first half of 1933, as compared to 65.9 and 69.5 in the same period in 1932 and 1931, respectively. Of 28 States with data for both years, 22 had lower rates in 1933 than in 1932, 5 had higher rates, and in 1 State the rate was the same in both years.

Infant mortality was the same in the first half of 1933 and 1932, 59 per 1,000, but was lower than the 1931 figure of 66 per 1,000. Of 26 States with data for both years, 15 had higher rates in 1933 than 1932, 9 had lower rates, and in 2 States the rate remained the same.

In spite of a minor influenza epidemic that extended into the early weeks of 1933, the pneumonia death rate in this group of States was lower for the first half of 1933 than in 1932 or 1931. The same is true of the rate for influenza and pneumonia combined, in spite of a slightly higher rate for influenza in 1933.

The rate for diarrhea and enteritis under 2 years of age was 7.0 per 100,000 total population in 1933 as compared with 7.4 and 8.2 in the same period of 1932 and 1931, respectively. However, in 16 of the 28 States with data for both 1933 and 1932, the rate was higher in 1933 than in 1932.

Mortality from cancer and diseases of the heart continued their steady increase.

Mortality from certain causes in the first 6 months of 1933, with comparative data for the corresponding period in preceding years

State and period	All causes, rate per 1,000 population	Rate per 1,000 live births			Death rate per 100,000 population (annual basis)																				
		Total infant mortality	All except malformations and early infancy	Maternal mortality	Typhoid fever (1)	Measles (7)	Scarlet fever (8)	Whooping cough (9)	Diphtheria (10)	Influenza (11)	Poliomyelitis (16)	Lethargic encephalitis (17)	Meningococcus meningitis (18)	Tuberculosis, all forms (23–32)	Cancer, all forms (45–53)	Diabetes (59)	Diseases of the nervous system (78–89)	Cerebral hemorrhage, apoplexy (82a–b)	Diseases of the circulatory system (90–103)	Diseases of the heart (90–95)	Diseases of the respiratory system (104–114)	Pneumonia, all forms (107–109)	Diseases of the digestive system (115–129)	Diarrhea and enteritis under 2 years (119)	Nephritis (140–150)
25 States.*																									
January to June—																									
1933	11.1	59	27	6.1	1.5	2.6	2.4	3.0	2.0	38.2	0.3	0.8	1.0	60.2	104.6	23.3	108.7	84.1	268.4	234.8	95.9	83.7	63.6	7.0	83.6
1932	11.3	59	27	6.4	1.9	2.7	2.7	4.9	3.5	34.3	.4	.7	1.6	65.9	102.4	23.3	111.3	86.1	267.6	232.7	106.8	94.4	65.1	7.4	86.4
1931	11.8	66	31	6.8	1.6	4.1	2.7	3.3	2.9	41.9	.5	1.1	2.8	69.5	100.5	21.9	114.1	86.4	265.2	229.3	127.1	113.1	68.4	8.2	86.6
January to March—																									
1933	11.7	65	31	6.2	1.3	2.0	2.6	3.0	2.6	63.3	.3	.8	1.2	60.3	104.0	25.3	113.4	88.5	283.7	248.9	120.7	107.7	59.6	5.2	86.3
1932	11.8	60	29	6.4	2.0	2.1	2.9	4.9	4.6	44.1	.4	.8	1.9	65.5	101.8	24.8	114.9	89.5	280.8	244.3	130.0	116.0	62.4	5.6	89.7
1931	12.6	74	40	7.0	1.4	3.3	2.8	3.3	3.6	60.9	.5	1.0	3.2	69.3	100.0	23.3	118.2	89.7	283.4	245.1	164.8	149.2	66.0	7.2	89.7
April to June—																									
1933	10.4	54	23	6.1	1.7	3.3	2.2	3.0	1.4	12.9	.4	.7	.9	60.0	105.2	21.4	104.1	79.8	253.2	220.9	71.4	59.9	67.6	8.8	81.1
1932	10.8	57	26	6.4	1.8	3.3	2.4	4.9	2.4	24.5	.4	.7	1.4	66.2	103.1	21.8	107.7	82.7	254.4	221.0	83.7	72.8	67.8	9.1	83.0
1931	11.1	58	26	6.7	1.9	4.9	2.5	3.4	2.2	23.2	.5	1.1	2.5	69.6	100.9	20.5	110.0	83.1	247.2	213.8	89.9	77.4	70.8	9.3	83.4
JANUARY TO JUNE																									
Alabama:																									
1933	9.5	67	42	6.7	2.8	1.2	.4	6.7	2.5	47.7	.4	1.3	.4	71.1	55.1	9.2	83.9	57.1	135.4	124.4	69.9	64.1	58.4	14.1	79.0
1932	10.0	62	39	7.8	4.0	.4	1.1	7.2	4.1	40.7	.3	.7	.6	79.3	54.1	8.0	88.7	59.3	122.1	112.7	88.9	82.7	61.1	11.9	81.4
1931	11.1	71	45	8.0	2.4	11.4	1.3	3.5	3.4	64.5	.8	1.5	4.3	86.0	53.5	10.2	93.3	61.8	132.3	121.8	127.3	116.8	62.9	11.4	93.4
1930	11.7	78	47	8.5	3.6	4.3	.8	11.1	3.6	49.0	.6	.8	1.7	85.9	49.5	9.3	99.7	62.2	150.2	133.2	124.6	112.0	77.9	24.7	101.3
1929	13.2	86	55	9.3	4.5	3.8	1.0	9.5	4.2	212.3	1.2	1.3	1.3	83.8	45.6	9.4	99.2	57.9	139.7	130.4	128.9	121.4	94.9	22.2	91.5
California:																									
1933	11.7	55	24	5.1	.9	2.5	1.4	3.3	2.1	21.9	.1	.5	1.6	81.3	127.4	24.0	117.8	87.0	320.7	286.2	89.3	76.4	64.3	4.8	83.7
1932	11.1	54	24	6.2	1.1	1.6	1.0	2.3	3.4	13.0	.3	.5	1.7	87.1	119.5	21.3	107.6	79.8	294.8	260.5	82.2	69.1	64.8	6.7	86.2
1931	11.7	60	29	6.3	1.5	3.3	1.3	2.7	2.7	19.2	.7	.8	3.1	96.2	124.5	19.8	110.0	78.9	290.9	256.1	89.8	76.1	74.7	10.3	85.6
1930	11.9	60	29	5.9	1.4	8.6	1.8	3.8	3.6	10.5	1.4	1.1	3.9	108.0	122.2	20.3	114.8	83.3	291.4	248.2	95.1	80.9	78.4	15.1	84.6
1929	12.6	68	36	5.3	1.5	.3	2.5	6.4	3.0	30.8	.8	1.5	9.8	116.2	117.0	19.4	119.0	83.4	304.1	267.8	109.0	95.0	76.4	10.9	96.1

* States included are: Alabama, California, Connecticut, District of Columbia, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Louisiana, Maryland, Michigan, Minnesota, Montana, Nebraska, New Jersey, New York, Ohio, Pennsylvania, South Dakota, Tennessee, Virginia, West Virginia, Wisconsin.

Mortality from certain causes in the first 6 months of 1933, with comparative data for the corresponding period in preceding years—Continued

State and period	All causes, rate per 1,000 population	Rate per 1,000 live births: Total infant mortality	All except malformations and early infancy	Maternal mortality	Death rate per 100,000 population (annual basis): Typhoid fever (1)	Measles (7)	Scarlet fever (8)	Whooping cough (9)	Diphtheria (10)	Influenza (11)	Poliomyelitis (16)	Lethargic encephalitis (17)	Meningococcus meningitis (18)	Tuberculosis, all forms (23–32)	Cancer, all forms (45–53)	Diabetes (59)	Diseases of the nervous system (78–89)	Cerebral hemorrhage, apoplexy (82a–b)	Diseases of the circulatory system (90–103)	Diseases of the heart (90–95)	Diseases of the respiratory system (104–114)	Pneumonia, all forms (107–109)	Diseases of the digestive system (115–129)	Diarrhea and enteritis under 2 years (119)	Nephritis (140–150)
JANUARY TO JUNE—contd.																									
Connecticut:																									
1933	11.1	52	(2)	7.5	.5	1.0	2.0	2.3	1.2	35.7	(1)	.9	.5	54.0	130.6	25.3	(2)	(2)	(2)	216.0	(2)	93.1	(2)	4.5	92.0
1932	10.8	58	(2)	6.1	.7	1.8	1.7	3.9	1.0	22.5	.4	1.0	1.0	54.4	114.1	29.1	(2)	(2)	(2)	226.4	(2)	89.3	(2)	3.9	94.6
1931	10.9	59	(2)	(2)	.2	3.7	1.2	2.0	1.2	29.1	.4	.7	.7	56.7	111.1	24.9	(2)	(2)	(2)	210.4	(2)	101.9	(2)	5.9	88.9
1930	11.8	68	(2)	(2)	.5	.1	2.9	2.5	3.3	22.3	.8	1.3	1.6	66.9	115.8	20.4	(2)	(2)	(2)	201.4	(2)	128.5	(2)	9.0	81.0
1929	12.6	76	(2)	(2)	.6	5.7	1.3	3.3	3.8	69.3	.3	1.4	1.4	69.3	112.6	17.9	(2)	(2)	(2)	211.5	(2)	149.9	(2)	8.8	83.9
District of Columbia:																									
1933	16.5	64	26	5.0	1.2	1.2	4.9	.4	1.6	15.5	(1)	.4	2.9	135.3	153.2	27.7	167.0	127.1	428.6	353.6	149.9	131.6	107.1	9.4	129.6
1932	17.0	69	31	8.5	.8	(1)	4.4	5.7	4.8	17.8	.4	2.0	4.8	128.4	156.3	29.9	165.6	117.5	402.2	344.1	184.5	162.3	86.8	4.8	158.7
1931	16.8	70	36	6.7	2.0	4.9	.8	1.2	5.7	31.1	.8	.8	9.0	118.2	136.2	31.1	171.0	113.7	387.4	321.9	222.1	194.3	94.5	7.4	155.4
1930	15.8	68	33	10.2	1.2	(1)	2.9	4.1	3.7	7.8	(1)	.4	2.1	127.7	136.4	29.3	143.8	103.7	399.6	345.9	170.3	145.5	92.6	6.6	175.2
1929	16.9	69	34	6.0	1.3	(1)	3.3	5.4	7.9	38.0	.4	(1)	2.1	136.9	131.0	29.2	147.7	91.4	410.6	350.9	219.5	193.7	91.0	5.8	183.2
Florida:																									
1933	12.0	70	35	11.4	4.6	.1	.1	2.9	3.8	61.5	.5	.8	.8	66.1	82.1	15.9	121.3	92.6	208.8	191.4	76.9	65.2	73.6	8.2	122.2
1932	11.5	65	34	9.8	6.2	1.0	.6	1.8	5.2	35.8	.6	(1)	(1)	73.6	76.3	17.0	122.0	104.7	204.2	188.9	75.0	62.6	92.3	14.3	108.4
1931	12.7	69	35	10.3	5.8	3.2	.3	2.2	3.7	68.7	.1	.5	1.1	71.1	70.2	14.1	134.0	112.1	221.8	205.6	85.6	70.3	86.9	10.4	124.8
1930	12.9	69	35	10.2	4.9	7.0	.3	4.0	3.7	31.0	.8	.5	.4	71.9	73.8	16.2	133.5	111.7	214.6	187.1	92.2	72.5	92.7	18.1	127.6
Georgia:																									
1933	10.0	72	(2)	8.0	4.4	1.7	.4	6.4	2.7	66.2	.9	.1	.4	57.8	51.3	11.6	101.1	71.0	130.7	121.3	94.2	86.1	61.5	12.5	106.0
1932	10.7	70	(2)	9.7	8.6	.5	1.2	4.0	4.0	45.4	1.2	.6	1.0	67.7	48.8	11.9	118.4	81.6	143.7	132.2	110.4	101.1	62.6	10.6	111.9
1931	11.5	75	(2)	11.0	6.8	3.5	2.1	4.5	3.3	76.8	.8	.5	2.2	75.7	50.6	10.4	119.6	(2)	151.7	137.7	120.1	110.8	64.1	12.8	110.4
1930	12.2	85	(2)	10.4	7.0	7.4	1.0	9.5	2.7	49.5	1.2	.3	4.2	77.9	49.5	11.9	131.7	(2)	156.1	141.1	126.0	113.5	80.2	20.4	142.4
1929	12.1	(2)	(2)	(2)	5.8	1.9	1.0	6.7	3.3	152.9	(2)	.3	2.7	78.2	45.0	9.6	(2)	(2)	(2)	121.8	(2)	97.6	(2)	16.0	133.4
Hawaii:																									
1933	10.1	79	50	5.3	8.5	.5	(1)	17.5	2.1	10.1	1.1	(1)	1.1	111.3	75.3	14.8	72.6	51.9	125.6	113.9	113.9	97.5	108.6	47.7	82.7
1932	10.4	82	(2)	(2)	2.2	13.4	.5	2.2	7.5	5.4	1.1	.5	4.8	101.6	70.4	9.1	(2)	52.7	(2)	103.2	(2)	121.5	122.1	60.8	67.8
1931	10.4	77	(2)	(2)	3.2	14.2	(2)	(1)	7.4	13.2	1.1	(1)	2.6	107.9	47.9	14.7	(2)	57.4	(2)	115.3	(2)	120.0	117.9	51.1	78.5
1930	11.5	89	(2)	(2)	2.2	7.3	(2)	6.8	13.5	7.9	(1)	(1)	6.8	107.0	61.4	14.1	(2)	47.9	(2)	131.8	(2)	138.0	158.9	91.8	82.2
1929	14.1	113	(2)	(2)	4.6	7.5	(2)	49.7	11.0	27.2	.6	(1)	36.4	112.1	67.0	12.7	(2)	52.6	(2)	131.2	(2)	190.1	195.9	121.9	(2)

Idaho:																									
1933	10.0	52	17	1.9	5.0	.9	(1)	.5	2.3	28.4	(1)	(1)	1.4	30.2	87.3	11.3	113.4	77.4	209.3	175.6	95.4	78.8	59.0	.9	36.
1932	9.6	66	38	5.6	2.2	(1)	.9	(1)	3.6	21.5	.4	1.3	3.1	33.7	62.8	12.6	119.4	90.2	205.6	166.1	98.8	87.1	57.0	2.2	47.
1931	10.3	61	30	3.2	1.8	3.2	1.8	11.3	2.3	14.0	.9	3.2	7.7	29.3	65.9	10.8	137.6	112.8	197.1	174.1	111.4	102.9	56.8	2.3	37.
1930	10.0	58	22	4.7	2.7	1.8	2.3	3.6	2.3	13.1	(1)	(1)	8.6	36.2	60.1	7.7	106.7	68.7	200.2	174.5	142.9	122.5	52.4	.9	41.
Illinois:																									
1933	11.0	58	24	5.5	.8	1.2	4.9	.7	1.7	25.0	.4	.6	4.4	56.8	116.9	27.9	106.9	80.6	280.3	261.4	89.0	76.4	69.9	5.1	106.
1932	10.9	58	25	5.5	.9	1.0	4.7	4.5	3.2	29.8	.5	.5	2.4	58.6	112.5	27.2	102.2	75.5	257.0	238.0	94.4	80.0	69.9	4.9	115.
1931	(2)	(2)	(2)	(2)	1.0	8.0	7.0	2.3	5.7	35.5	.4	.6	4.7	63.6	(2)	(2)	(2)	(2)	(2)	(2)	(2)	102.5	(2)	(2)	(2)
1930	(2)	(2)	(2)	(2)	.8	1.8	5.5	2.0	7.9	16.1	.2	.4	3.4	64.0	(2)	(2)	(2)	(2)	(2)	(2)	(2)	81.9	(2)	(2)	(2)
1929	(2)	(2)	(2)	(2)	1.0	6.4	5.0	3.1	9.9	61.4	.1	1.1	4.4	78.9	(2)	(2)	(2)	(2)	(2)	(2)	(2)	111.3	(2)	(2)	(2)
Indiana:																									
1933	11.6	57	25	5.4	1.8	.6	2.6	2.2	3.3	48.1	.4	1.3	2.0	57.7	106.7	16.3	(2)	112.9	(2)	187.3	(2)	80.5	(2)	5.8	79.
1932	11.8	59	26	5.6	1.0	.8	3.1	7.8	4.3	49.9	.2	.9	5.8	63.5	104.1	16.9	(2)	115.0	(2)	180.6	(2)	103.6	(2)	6.9	71.
1931	12.4	63	32	6.6	1.3	8.5	4.9	4.3	3.5	56.4	.5	.7	7.0	60.5	105.8	16.4	(2)	114.4	(2)	182.3	(2)	118.8	(2)	5.4	80.
1930	12.5	57	25	6.5	1.3	2.5	2.7	4.2	3.6	25.1	.3	.8	12.8	73.7	104.6	17.9	(2)	117.4	(2)	202.6	(2)	106.9	(2)	7.3	91.
1929	13.3	70	(2)	7.8	1.6	7.2	4.7	6.5	4.2	101.1	.3	.6	1.5	78.0	97.9	15.1	(2)	116.1	(2)	218.9	(2)	131.8	(2)	8.3	87.
Iowa:																									
1933	10.8	55	24	4.9	1.0	.3	1.5	2.3	1.2	56.4	2.3	1.1	2.0	26.6	123.4	21.3	143.8	116.8	256.0	201.4	113.0	91.5	52.0	1.5	45.
1932	10.6	51	21	3.5	.8	.3	2.0	1.9	1.6	39.8	1.1	1.1	1.1	29.1	112.0	16.5	145.4	115.1	260.7	213.2	117.2	93.8	57.3	2.0	49.
1931	11.2	60	27	6.1	.6	.2	2.8	2.8	1.5	43.6	.3	2.5	4.0	29.3	119.0	23.3	142.3	112.7	253.2	224.5	105.2	91.6	69.3	4.1	43.
1930	11.0	60	25	7.5	1.1	14.5	3.9	4.6	2.1	35.5	.1	2.8	3.8	34.3	108.6	23.2	140.9	97.0	261.2	210.4	111.3	101.8	69.2	3.0	44.
1929	11.2	60	25	6.3	1.3	1.6	2.7	5.0	.8	90.4	.7	1.6	2.3	35.7	110.8	19.9	140.4	101.9	268.9	323.4	95.0	77.9	62.1	3.8	55.
Kansas:																									
1933	11.3	62	30	5.8	1.0	1.4	1.9	3.1	2.3	80.2	.2	.4	1.5	33.9	104.6	25.8	134.9	111.7	222.9	202.5	88.1	76.5	66.7	4.9	100.8
1932	10.2	49	19	6.7	.7	2.4	1.8	2.4	3.5	46.0	.2	.6	2.0	34.6	104.6	22.4	124.7	102.9	203.1	182.3	68.4	59.8	62.0	5.0	104.5
1931	10.4	60	28	7.1	1.4	.7	1.5	1.6	1.9	48.1	.7	.9	1.6	38.6	94.7	24.2	128.1	101.5	203.3	152.2	83.0	73.1	67.5	6.1	104.3
1930	10.8	57	26	8.0	1.1	7.6	3.1	4.9	3.9	43.4	.5	.4	3.5	38.6	95.0	23.6	132.1	100.6	211.1	183.1	83.7	73.2	66.8	7.6	109.0
1929	11.2	69	35	7.4	2.0	4.0	4.6	4.7	2.8	85.8	.4	.8	3.3	46.4	91.5	21.9	147.9	118.1	200.0	174.5	89.7	77.1	69.9	7.1	96.3
Louisiana:																									
1933	10.5	77	46	8.7	7.6	2.3	.4	5.3	2.2	53.1	.3	.2	1.7	74.6	70.3	12.4	84.7	62.2	203.2	185.3	81.4	71.3	70.7	16.4	98.7
1932	10.1	67	38	9.2	11.0	2.1	.5	5.0	4.8	29.4	.3	.4	1.5	77.2	59.0	11.6	79.1	60.4	195.5	180.3	87.2	73.4	65.4	13.3	99.5
1931	11.5	73	44	9.7	7.5	.8	.8	4.8	4.3	72.0	1.0	.4	3.6	90.3	67.0	14.4	83.4	58.0	217.8	199.9	118.2	106.8	79.7	19.6	110.5
1930	12.4	94	61	10.9	8.5	8.1	.3	6.7	4.5	52.7	1.3	.7	5.2	94.6	65.6	14.7	96.7	64.9	230.4	212.5	125.4	112.6	88.8	24.0	120.4
1929	12.3	86	58	11.3	7.8	3.9	.6	6.0	4.2	132.2	.6	.5	3.0	95.1	64.1	11.3	93.2	59.9	213.9	197.6	109.3	93.1	86.1	26.0	110.8
Maryland:																									
1933	12.9	62	27	5.2	.7	.2	2.9	2.4	1.1	26.5	(1)	1.0	1.0	87.8	118.3	27.2	132.6	103.0	308.9	278.3	126.8	115.6	61.6	9.1	154.2
1932	13.3	70	36	4.7	1.6	2.0	2.0	7.8	4.0	29.0	.2	.6	1.1	95.7	116.4	27.8	145.2	111.8	304.4	278.1	140.2	114.1	71.4	13.8	149.5
1931	14.3	76	41	6.4	1.8	10.5	2.3	5.4	2.3	36.4	.4	1.5	1.9	102.7	113.4	24.6	153.0	121.7	315.6	285.5	192.5	177.2	69.5	12.3	145.7
1930	13.7	64	32	5.6	2.1	.6	3.3	5.4	3.1	15.7	.1	.9	2.2	111.3	110.7	23.7	148.5	110.7	299.3	264.4	168.0	151.2	67.6	12.5	162.1
Michigan:																									
1933	10.2	52	17	5.9	.6	4.1	4.6	3.7	2.3	28.1	.1	.4	.8	51.1	97.2	23.4	114.3	86.1	266.4	240.9	75.8	64.2	63.5	4.8	63.1
1932	10.3	57	22	6.3	.6	5.8	3.0	3.8	2.6	31.5	.3	.5	2.0	52.0	92.4	23.4	115.9	88.4	254.9	230.9	91.0	77.6	63.8	4.7	61.7
1931	10.6	62	27	6.9	.8	.9	3.6	4.3	3.5	28.2	.2	.9	3.5	58.8	91.6	18.8	122.6	99.4	248.3	221.1	97.2	82.4	63.1	5.6	62.6
1930	11.4	69	31	6.6	1.1	8.6	3.9	3.8	7.9	17.2	.4	1.2	12.4	66.1	89.7	19.0	127.8	96.4	246.8	218.0	114.2	95.2	75.1	8.4	66.2
1929	13.0	74	38	6.7	1.4	4.8	4.6	6.5	10.9	66.4	.7	1.6	25.4	74.4	91.2	21.8	141.5	100.8	271.8	239.2	144.4	125.7	83.4	12.0	71.7

[1] No deaths.

[2] Data not available.

Mortality from certain causes in the first 6 months of 1933, with comparative data for the corresponding period in preceding years—Continued

State and period	All causes, rate per 1,000 population	Rate per 1,000 live births: Total infant mortality	Rate per 1,000 live births: All except malformations and early infancy	Rate per 1,000 live births: Maternal mortality	Death rate per 100,000 population (annual basis): Typhoid fever (1)	Measles (7)	Scarlet fever (8)	Whooping cough (9)	Diphtheria (10)	Influenza (11)	Poliomyelitis (16)	Lethargic encephalitis (17)	Meningococcus meningitis (18)	Tuberculosis, all forms (23–32)	Cancer, all forms (45–53)	Diabetes (59)	Diseases of the nervous system (78–89)	Cerebral hemorrhage, apoplexy (82a–b)	Diseases of the circulatory system (90–103)	Diseases of the heart (90–95)	Diseases of the respiratory system (104–114)	Pneumonia, all forms (107–109)	Diseases of the digestive system (115–129)	Diarrhea and enteritis under 2 years (119)	Nephritis (140–150)
JANUARY TO JUNE—contd.																									
Minnesota:																									
1933	10.2	53	23	5.1	.6	4.8	2.2	3.0	1.1	41.0	.2	1.2	1.8	43.2	131.6	21.5	100.5	82.1	232.8	209.8	82.7	72.5	62.0	4.5	58.4
1932	9.8	47	15	4.3	.3	.2	2.7	1.2	.5	36.8	.3	.7	1.2	43.1	120.4	20.6	101.8	78.0	216.5	197.4	82.5	73.3	60.6	2.4	56.8
1931	10.4	53	21	5.0	.2	.4	1.2	2.1	1.2	35.5	.5	1.2	2.3	43.4	118.6	20.7	105.1	80.1	210.8	189.3	100.9	94.7	70.9	3.5	56.4
1930	10.0	46	17	5.4	.9	6.4	2.3	3.0	1.3	20.2	.3	1.5	2.7	49.4	116.5	18.9	110.0	83.5	199.1	181.7	89.3	84.9	67.4	5.3	55.2
1929	10.8	55	23	4.7	.5	5.1	3.1	5.5	2.4	67.4	.4	2.8	2.1	60.7	111.1	20.2	108.5	81.0	212.6	162.3	93.7	85.8	66.6	3.9	61.0
Mississippi																									
1933	9.7	(2)	(2)	(2)	4.4	4.0	.2	10.3	2.3	53.5	.2	.5	1.2	64.4	49.1	7.2	(2)	65.2	(2)	99.7	(2)	57.6	(2)	15.7	62.3
1932	9.0	(2)	(2)	(2)	3.4	(1)	.5	6.4	4.9	34.6	.7	.1	1.2	72.5	47.1	7.7	(2)	64.0	(2)	83.0	(2)	55.4	(2)	12.3	72.1
1931	10.8	(2)	(2)	(2)	3.9	.6	.4	2.6	3.6	67.4	.3	.1	2.4	84.3	50.9	7.7	(2)	71.5	(2)	105.5	(2)	84.5	(2)	10.1	89.4
1930	11.7	(2)	(2)	(2)	5.4	2.4	.5	10.2	3.4	43.8	.7	.1	11.4	85.6	47.7	9.7	(2)	71.7	(2)	106.6	(2)	85.3	(2)	9.3	105.4
1929	12.8	(2)	(2)	(2)	6.5	7.6	.1	11.2	2.6	193.6	.8	.5	.6	80.8	45.6	6.7	(2)	65.1	(2)	96.5	(2)	80.7	(2)	17.2	93.4
Montana:																									
1933	9.7	59	(2)	5.2	2.9	4.4	2.9	4.4	2.2	60.6	(1)	1.8	.4	54.4	79.7	12.1	99.9	76.8	169.8	158.7	83.8	71.3	69.1	4.8	62.1
1932	9.9	49	(2)	5.3	2.2	3.0	1.5	6.0	.7	56.8	1.5	1.1	1.9	55.7	86.3	19.1	106.5	73.6	183.5	165.2	85.6	69.5	68.4	3.4	68.8
1931	10.0	65	(2)	7.1	.3	.4	2.6	13.9	2.2	51.0	(1)	1.5	3.0	61.1	69.7	13.9	99.7	70.8	148.4	131.2	93.3	83.6	75.0	5.2	58.8
1930	9.9	57	(2)	7.8	3.0	4.5	4.1	1.5	.4	30.9	(1)	2.3	7.5	66.6	80.1	18.1	100.8	65.8	160.3	144.8	118.1	106.8	73.0	6.4	73.7
Nebraska:																									
1933	9.9	59	26	4.5	.3	1.0	2.0	1.6	1.3	56.6	.1	.4	.9	25.9	102.8	16.8	129.0	103.1	217.5	190.2	103.1	91.1	57.2	2.9	61.6
1932	9.4	45	16	5.4	1.3	.3	2.4	1.9	1.6	42.0	.3	.4	.7	22.5	102.1	23.8	116.0	95.3	196.1	174.3	80.6	69.7	62.2	4.0	82.9
1931	9.9	53	23	4.8	.6	.1	2.5	5.5	2.5	33.1	1.0	.4	3.1	26.7	95.6	22.5	119.7	95.0	200.6	172.3	80.8	72.8	68.6	4.8	68.9
1930	10.7	49	19	5.2	.7	12.1	3.3	3.7	3.2	23.0	.4	.9	3.3	26.4	106.1	23.9	112.5	88.2	196.5	174.0	93.3	82.2	70.8	4.9	56.6
1929	10.7	63	32	6.7	1.5	3.1	6.6	3.8	4.0	80.5	.1	1.0	3.5	34.4	95.3	22.9	126.0	94.7	205.5	184.3	93.7	82.4	73.1	5.4	57.6
New Jersey:																									
1933	10.8	50	(2)	5.4	.8	2.9	2.3	.7	.7	18.6	.1	.7	.6	60.0	115.8	30.2	110.6	86.3	303.5	280.8	98.3	86.9	62.7	4.8	92.2
1932	10.6	52	(2)	6.3	.3	1.5	2.1	4.2	2.6	22.2	.4	.7	.9	65.8	105.9	26.8	107.1	81.9	280.7	248.6	98.7	83.5	58.6	4.4	95.6
1931	11.3	64	(2)	5.9	.8	4.3	3.5	2.7	4.4	22.3	.2	1.1	2.3	69.5	110.7	26.5	114.3	84.8	287.0	257.1	122.1	103.3	66.6	7.3	104.0
1930	11.4	63	(2)	6.0	.8	5.4	2.3	2.5	11.5	12.2	.2	1.0	2.0	73.9	104.5	25.9	114.7	85.0	273.2	247.9	117.7	106.8	71.0	8.9	105.6
1929	12.6	67	(2)	5.6	.7	1.4	1.5	6.2	12.0	44.5	.4	1.5	2.8	76.5	107.8	24.6	120.2	87.8	297.4	273.2	163.4	146.5	71.9	8.5	109.5
New York:																									
1933	11.9	58	26	7.1	.4	4.6	2.5	2.6	1.3	16.5	.2	.9	.9	63.2	126.2	32.6	82.7	54.5	364.5	308.3	123.3	111.9	69.4	6.5	78.5
1932	12.2	56	25	6.4	.5	2.7	4.5	2.4	2.9	18.4	.3	.8	1.7	69.6	125.5	33.6	81.0	55.0	369.6	314.6	136.7	124.6	66.9	5.7	81.1
1931	12.7	64	30	6.7	.5	2.9	2.6	3.0	2.5	23.3	.2	1.1	1.9	71.8	124.8	30.0	84.3	55.6	368.3	312.5	161.8	148.6	68.2	6.8	79.5

1930	12.5	64	30	6.0	.9	3.3	1.6	2.7	3.6	11.8	.3	.8	2.9	76.5	122.7	28.9	85.1	54.5	365.5	298.7	145.4	133.5	72.4	9.4	83.4
1929	13.8	69	33	5.8	.8	2.3	2.2	3.4	6.9	48.0	.3	1.2	5.8	82.2	121.2	28.4	96.0	63.2	391.1	325.4	175.0	172.2	72.5	9.9	82.5
North Carolina:																									
1933	9.8	73	(2)	6.7	2.1	3.6	.9	5.9	2.7	48.4	.2	.4	.2	68.3	48.6	10.7	(2)	(2)	(2)	(2)	(2)	79.6	(2)	20.3	(2)
1932	9.8	71	(2)	7.5	3.4	2.6	1.0	8.6	3.5	27.2	.5	.9	.8	67.0	44.3	11.6	(2)	(2)	(2)	(2)	(2)	104.3	(2)	15.5	(2)
1931	11.1	80	(2)	8.4	1.7	5.0	2.1	5.3	4.7	60.0	.4	.4	.4	75.8	(2)	(2)	(2)	(2)	(2)	(2)	(2)	125.7	(2)	14.4	(2)
1930	12.4	84	(2)	8.1	1.8	.1	1.0	11.2	4.6	37.9	.4	.6	1.1	82.9	(2)	(2)	(2)	(2)	(2)	(2)	(2)	118.5	(2)	28.9	(2)
1929	12.8	(2)	(2)	(2)	2.8	.9	1.7	9.2	6.5	139.4	.8	(1)	.5	90.4	(2)	(2)	(2)	(2)	(2)	(2)	(2)	116.4	(2)	25.5	(2)
Ohio:																									
1933	11.2	53	19	6.7	1.0	3.1	3.6	2.1	1.9	35.3	.3	1.2	.6	56.4	112.5	23.5	130.4	109.8	286.6	254.8	78.1	68.4	60.7	3.7	81.9
1932	11.7	60	25	5.8	.8	4.2	4.1	7.0	3.5	41.5	.3	.8	1.2	64.0	109.9	26.8	139.0	116.6	287.5	252.2	97.5	92.2	58.5	4.6	83.1
1931	12.0	62	26	6.7	1.2	3.5	4.4	1.7	2.0	48.5	.6	1.0	2.0	67.5	105.4	21.9	141.0	116.5	271.0	237.6	119.1	107.2	61.3	4.4	79.3
1930	12.0	60	25	6.5	1.7	5.1	2.8	3.8	3.0	26.0	.5	1.1	2.3	70.8	107.1	23.0	122.9	111.9	273.1	242.6	108.5	96.6	60.1	6.5	84.3
1929	13.7	70	33	6.5	1.1	6.3	2.8	10.4	3.3	107.4	.6	1.8	3.3	76.0	103.6	18.7	(2)	116.3	(2)	242.2	(2)	121.8	(2)	6.2	90.2
Pennsylvania:																									
1933	11.3	57	26	5.4	.5	1.7	4.1	1.7	2.7	37.0	.4	.7	1.2	53.5	103.4	28.6	111.9	88.5	286.9	260.7	93.4	80.7	58.5	7.0	101.3
1932	11.7	62	30	6.5	1.1	4.0	3.7	5.6	4.8	39.8	.4	.7	1.6	57.3	102.6	26.8	118.7	92.0	293.8	258.1	115.7	101.9	62.8	8.2	101.1
1931	12.4	73	40	6.4	.9	7.6	3.4	2.4	3.7	46.7	.3	1.2	2.5	61.8	97.9	27.0	118.5	89.3	288.2	254.8	148.4	132.1	67.6	10.9	100.0
1930	12.2	73	43	6.1	1.3	3.6	2.7	4.7	5.9	27.7	.3	1.0	2.6	67.0	96.9	23.0	120.6	89.7	282.9	252.4	138.3	122.3	70.7	12.3	109.2
1929	13.6	80	44	6.9	1.5	6.3	3.4	6.8	7.7	98.4	.5	1.2	2.5	71.5	101.5	24.4	130.3	95.0	288.1	260.3	163.8	142.6	72.4	13.0	114.3
South Dakota:																									
1933	9.6	64	31	4.3	8.3	1.1	2.9	4.6	2.3	70.6	.6	.3	.3	45.0	83.2	22.9	107.9	81.5	191.6	159.8	89.8	79.7	49.3	4.6	58.8
1932	8.2	52	24	4.2	2.0	(1)	1.4	5.2	3.4	37.9	1.1	.3	.9	41.4	83.6	16.1	84.2	67.2	179.0	158.9	63.5	50.8	59.2	4.3	39.6
1931	8.4	60	28	4.6	1.4	(1)	.6	4.9	2.6	36.0	2.0	.6	.3	34.0	81.8	20.5	100.1	62.5	153.5	131.7	89.0	72.3	69.1	6.0	38.3
1930	7.9	57	27	6.8	.9	5.2	1.2	3.5	2.0	27.4	.6	.3	(1)	42.0	68.5	19.2	82.8	53.0	135.2	112.2	75.5	62.9	52.5	7.3	46.9
1929	9.1	69	37	6.3	1.8	3.5	4.1	5.0	1.5	87.8	2.1	.9	2.6	54.0	63.4	20.6	89.3	54.9	150.3	133.9	94.8	80.7	63.1	4.4	34.9
Tennessee:																									
1933	10.2	73	47	6.1	4.3	2.3	1.1	6.1	2.7	62.0	.7	1.1	.8	92.6	56.7	10.7	86.7	59.8	116.1	99.2	98.0	85.8	72.3	14.4	58.9
1932	10.6	70	43	7.0	5.2	.2	.6	7.5	3.5	59.3	.4	.8	1.9	98.8	54.1	10.7	89.8	61.5	118.2	103.5	104.0	95.1	70.7	14.2	68.9
1931	10.8	73	48	8.3	3.3	7.0	2.4	4.2	2.7	63.6	.5	.4	6.6	110.5	54.7	10.4	98.4	61.3	131.8	116.9	126.5	115.4	61.7	9.0	67.4
1930	11.6	76	48	9.2	4.2	7.7	1.5	6.3	3.4	47.9	.8	1.0	15.8	122.4	54.6	10.7	104.2	61.5	137.3	121.8	122.1	110.6	80.0	16.5	81.7
1929	13.0	88	61	8.7	3.7	.5	2.4	6.7	4.2	189.7	1.0	.5	2.1	136.2	54.8	10.2	103.4	58.6	147.8	136.2	124.3	111.9	68.2	11.6	70.7
Virginia:																									
1933	11.5	71	(2)	6.1	2.5	3.6	1.7	4.7	2.4	63.1	.2	.5	1.2	84.6	73.1	15.4	130.5	104.1	217.9	199.8	93.1	82.6	59.0	12.9	92.8
1932	11.5	70	(2)	6.9	2.7	.9	1.2	17.3	5.1	49.8	.7	.8	1.6	90.4	67.9	15.7	117.5	94.0	207.6	191.9	96.9	85.3	60.1	11.7	98.7
1931	12.7	76	(2)	8.6	2.6	5.6	1.7	5.3	3.1	84.0	.3	.7	2.7	94.5	62.8	16.9	134.4	107.7	234.2	215.5	125.4	113.2	57.4	8.9	112.3
1930	12.3	73	(2)	7.0	2.0	6.6	1.4	14.0	4.7	41.8	.8	1.2	3.2	91.3	62.9	15.7	132.1	100.4	217.9	197.2	119.6	104.2	72.3	18.1	112.9
1929	13.3	83	(2)	7.8	2.7	2.5	.9	10.5	4.5	170.0	.5	1.4	1.8	98.9	63.1	11.0	136.1	96.3	214.2	194.7	105.0	92.7	63.1	12.0	102.6
West Virginia:																									
1933	9.2	(2)	(2)	5.2	3.3	4.1	1.6	5.2	4.0	55.8	1.3	.2	1.1	56.0	66.7	10.5	103.6	72.6	126.4	115.0	84.1	73.0	61.5	15.7	80.1
1932	9.6	(2)	(2)	5.6	4.1	16.5	2.4	13.7	8.6	52.3	.7	.4	1.3	56.0	61.9	13.2	109.1	80.5	122.3	109.7	100.0	88.9	64.2	19.5	63.9
1931	9.9	(2)	(2)	5.2	4.7	2.9	1.9	7.5	3.0	58.7	.5	.3	.9	59.2	56.3	10.7	97.3	70.0	138.9	114.6	122.3	113.0	59.6	12.8	61.4
1930	10.0	(2)	(2)	6.4	5.2	7.7	2.6	15.3	4.5	36.5	.3	.3	1.7	71.1	55.3	12.7	90.4	58.6	154.1	120.5	112.5	103.6	62.5	20.1	58.2
1929	11.5	(2)	(2)	6.2	8.0	6.3	1.2	12.5	3.4	167.0	.7	.7	1.0	72.6	60.3	9.2	91.2	52.6	169.0	118.1	125.7	105.4	65.5	20.3	58.5
Wisconsin:																									
1933	10.3	56	2.1	5.6	.5	1.5	1.6	1.6	.5	43.0	.3	.5	.7	44.0	108.7	27.0	(2)	92.5	(2)	237.1	(2)	65.8	(2)	6.5	65.9
1932	10.3	55	2.1	4.5	.3	2.7	2.3	2.7	1.9	36.1	.5	1.1	1.1	49.4	117.9	23.7	(2)	91.4	(2)	223.7	(2)	78.8	(2)	5.9	69.2
1931	11.0	61	(2)	5.0	.3	2.5	3.0	2.2	2.1	29.7	.3	2.0	1.8	52.3	115.8	(2)	(2)	(2)	(2)	(2)	(2)	93.6	(2)	8.0	(2)
1930	10.8	61	(2)	5.1	.4	5.7	4.3	3.7	2.4	20.0	.3	.8	2.6	55.4	113.7	(2)	(2)	(2)	(2)	(2)	(2)	89.4	(2)	7.9	(2)
1929	11.7	71	(2)	(2)	1.0	4.1	3.2	4.4	2.6	74.8	.4	1.9	5.7	57.5	103.2	(2)	(2)	(2)	(2)	(2)	(2)	98.7	(2)	12.7	(2)

[1] No deaths.

[2] Data not available.

COURT DECISION RELATING TO PUBLIC HEALTH

Nature of liability of city for nuisance caused in part by effluent from municipal septic tank.—(Minnesota Supreme Court; *Johnson et ux.* v. *City of Fairmont et al.*, 247 N.W. 572; decided Mar. 17, 1933.) The city of Fairmont discharged the effluent from its septic tank into a certain creek. Waste matter from two canning factories in the city also found its way into the said creek. This creek flowed through a dairy farm, and the farm's owners, husband and wife, brought action against the city and the canning company to recover damages for the nuisance alleged to have resulted from the pollution of the creek. A verdict in favor of the plaintiffs was rendered against the defendants jointly. The defendants then moved separately for judgment notwithstanding the verdict, and the trial court granted the defendants' respective motions. From the orders granting the motions, the plaintiffs appealed to the supreme court.

That court said that the evidence was sufficient to sustain the finding of the jury that the consequences from the acts of either defendant would constitute a nuisance, but it also stated that the serious question before it was whether tort-feasors acting independently, each causing damage, could be held jointly liable in an action for damages. The court put the matter thus:

> * * * Each [defendant] acted independently of the other, but each knew that the other was discharging matter in the creek that was producing offensive odors on plaintiffs' premises and knew that the plaintiffs claimed that a nuisance was thereby created thereon. No attempt was made at the trial to apportion or separate the damages. The plaintiffs attempt to hold defendants as joint tort-feasors. May this be done? * * *

In affirming the action of the lower court, the supreme court stated, in part, as follows:

> The weight of authority or general rule is that acts of independent tort-feasors, each of which cause some damage, may not be combined to create a joint liability at law for damages. * * *
>
> In the instant case there is no evidence to prove any concert of action between defendants to the injury of plaintiffs. There is no conspiracy. There is no evidence of any connection by joint action between the city discharging its effluent from its sewage tank and the canning factory discharging its waste. Each acted solely in its own interest. Each wronged plaintiffs, who suffered from defendants' independent acts; not from their joint acts. Their acts were separate as to time and place. Possibly there were times when both were concurrent. There was no concert of action, no common intent, no oneness of act. The point is that the wrong itself is not joint. The liability of each of the defendants began with their acts on their own premises, that being where they started the respective discharges on their way; and the act of each was wholly separate and independent of concert with the other. Their torts were separate, several, and independent when committed, and do not become joint because their consequences united and mingled on or near plaintiffs' farm.

DEATHS DURING WEEK ENDED NOV. 11, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Nov. 11, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	7,453	7,200
Deaths per 1,000 population, annual basis	10.4	10.3
Deaths under 1 year of age	500	545
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	43	45
Deaths per 1,000 population, annual basis, first 45 weeks of year	10.8	11.0
Data from industrial insurance companies:		
Policies in force	67,499,001	70,000,097
Number of death claims	10,871	9,464
Death claims per 1,000 policies in force, annual rate	8.4	7.1
Death claims per 1,000 policies, first 45 weeks of year, annual rate	9.7	9.5

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Nov. 18, 1933, and Nov. 19, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Nov. 18, 1933, and Nov. 19, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Nov. 18, 1933	Week ended Nov. 19, 1932	Week ended Nov. 18, 1933	Week ended Nov. 19, 1932	Week ended Nov. 18, 1933	Week ended Nov. 19, 1932	Week ended Nov. 18, 1933	Week ended Nov. 19, 1932
New England States:								
Maine	7	2	1	4	6	1	0	1
New Hampshire		1			12		0	0
Vermont	1				4	4	0	0
Massachusetts	29	45		4	202	78	0	2
Rhode Island	3	2					0	1
Connecticut	26	3	3	29	5	11	2	2
Middle Atlantic States:								
New York	44	58	[1] 15	[1] 18	287	345	1	7
New Jersey	20	17	15	10	23	211	4	2
Pennsylvania	83	113			138	106	3	4
East North Central States:								
Ohio	83	72	4	4	9	86	0	1
Indiana	102	110	30	52	15	2	3	3
Illinois	55	130	22	28	21	47	8	14
Michigan	26	28	1	25	72	157	1	3
Wisconsin	11	9	25	22	67	115	0	0
West North Central States:								
Minnesota	18	23			80	110	1	0
Iowa [2]	25	13			2	1	0	1
Missouri	64	80	12	3	22	11	0	0
North Dakota	15	7	1		27	36	1	0
South Dakota	5	1		5	148	3	0	0
Nebraska	12	27	9	1	6	2	0	0
Kansas	22	30		1	8	7	1	0
South Atlantic States:								
Delaware	4	1		1			1	0
Maryland [3]	29	24	5	13	6	12	0	1
District of Columbia	13	3		3	11	1	0	1
Virginia	95	48			28	43	0	0
West Virginia	62	49	32	10	1	35	0	1
North Carolina [3]	149	66	28	10	138	68	4	0
South Carolina	31	30	385	500	119	17	0	0
Georgia [3]	48	45			92		1	0
Florida [3]	16	37	1	3	1	1	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Nov. 18, 1933, and Nov. 19, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Nov. 18, 1933	Week ended Nov. 19, 1932	Week ended Nov. 18, 1933	Week ended Nov. 19, 1932	Week ended Nov. 18, 1933	Week ended Nov. 19, 1932	Week ended Nov. 18, 1933	Week ended Nov. 19, 1932
East South Central States:								
Kentucky	142	50		55	5	38	0	0
Tennessee	65	67	49	271	114	1	3	0
Alabama [3]	45	55	22	204	21	3	1	0
Mississippi	32	38					0	0
West South Central States:								
Arkansas	30	17	15	24	36		0	0
Louisiana	61	35	11	23	5	7	1	0
Oklahoma [4]	72	56	47	31	38	2	0	0
Texas [3]	346	145	175	71	35		1	0
Mountain States:								
Montana	6	2	7	1		153	0	0
Idaho		5	1	12	4		0	0
Wyoming	2				22	5	0	0
Colorado	3	14			2	3	0	0
New Mexico	14	18	1	146	19	3	0	1
Arizona	5		15	175	2		0	0
Utah [3]				333	41		0	0
Pacific States:								
Washington	13	9		1	55	4	1	0
Oregon	1	7	22	81	18	39	0	0
California	53	75	55	903	172	49	4	4
Total	1,988	1,667	1,009	3,086	2,229	1,907	42	49

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Nov. 18, 1933	Week ended Nov. 19, 1932	Week ended Nov. 18, 1933	Week ended Nov. 19, 1932	Week ended Nov. 18, 1933	Week ended Nov. 19, 1932	Week ended Nov. 18, 1933	Week ended Nov. 19, 1932
New England States:								
Maine	1	0	14	10	0	0	2	4
New Hampshire	3	0	19	19	0	0	0	1
Vermont	2	0	9	8	0	0	0	0
Massachusetts	0	0	170	265	0	0	2	3
Rhode Island	0	0	12	24	0	0	0	0
Connecticut	0	0	60	55	0	0	1	1
Middle Atlantic States:								
New York	10	5	328	409	0	22	16	18
New Jersey	2	5	118	154	0	0	5	6
Pennsylvania	15	10	443	416	0	0	32	23
East North Central States:								
Ohio	0	0	457	322	0	49	5	18
Indiana	2	3	177	131	2	8	8	7
Illinois	2	5	381	361	1	0	14	21
Michigan	1	2	300	210	0	11	9	7
Wisconsin	2	1	72	89	18	0	0	2
West North Central States:								
Minnesota	0	1	64	85	5	2	5	2
Iowa [3]	0	1	95	26	3	6	3	0
Missouri	0	0	130	93	0	1	6	5
North Dakota	2	0	52	4	0	7	2	1
South Dakota	0	0	11	12	0	0	1	0
Nebraska	3	1	45	45	4	7	0	2
Kansas	1	2	131	102	0	2	4	3
South Atlantic States:								
Delaware	0	0	4	3	0	0	5	1
Maryland [3]	0	0	91	92	0	0	13	12
District of Columbia	0	0	17	7	0	0	3	6
Virginia	0	2	113	86	0	0	8	13
West Virginia	0	0	125	71	1	0	11	17
North Carolina [3]	1	0	234	99	0	0	4	3
South Carolina	1	0	5	12	0	1	8	7
Georgia [3]	0	0	17	86	0	0	12	15
Florida [3]	0	0	2	8	0	0	8	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Nov. 18, 1933, and Nov. 19, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Nov. 18, 1933	Week ended Nov 19, 1932	Week ended Nov. 18, 1933	Week ended Nov 19, 1932	Week ended Nov. 18, 1933	Week ended Nov. 19, 1932	Week ended Nov. 18, 1933	Week ended Nov. 19, 1932
East South Central States:								
Kentucky	1	1	122	56	1	4	10	14
Tennessee	3	2	113	68	0	0	11	23
Alabama [3]	0	0	46	41	0	1	7	2
Mississippi	0	2	22	28	0	0	5	0
West South Central States:								
Arkansas	1	0	15	29	1	0	4	6
Louisiana	1	2	27	24	0	1	19	8
Oklahoma [4]	0	1	36	28	8	0	14	19
Texas [3]	0	0	108	93	4	12	50	6
Mountain States:								
Montana	0	0	15	16	0	0	3	3
Idaho	0	0	2	2	3	4	1	0
Wyoming	0	0	11	6	0	0	1	0
Colorado	0	1	21	26	22	0	3	1
New Mexico	0	0	32	12	0	1	16	8
Arizona	0	0	11	9	0	0	0	0
Utah [2]	0	0	6	2	0	0	1	1
Pacific States:								
Washington	5	4	39	44	1	4	5	2
Oregon	1	1	41	27	6	1	1	0
California	4	2	225	179	5	0	9	11
Total	64	54	4,588	3,944	85	144	342	304

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Nov. 18, 1933, 28 cases, as follows: North Carolina, 1; Georgia, 13; Florida, 2; Alabama, 10; Texas, 2.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
October 1933										
Arizona		14	18	2	60		0	32	0	13
California	8	164	123	8	666	7	24	607	34	72
Iowa	1	82	2	1	6		13	272	4	16
Maryland	2	116	39	3	11	2	10	300	0	84
Michigan	3	128	19	13	41		21	834	1	80
Minnesota		79	4		16		95	212	12	23
Montana	1	9	9		10		2	65	0	10
New York	6	194		6	521		166	877	0	95
North Carolina	3	726	56		160	44	3	654	0	65
Ohio	4	446	191	11	66		80	1,860		148
Puerto Rico		82	175	5,758	84		0		0	19
South Carolina		315	972	1,605	113	118	1	65	0	49
West Virginia	5	467	103		29		15	543	20	131
Wisconsin		27	118		114		12	263	37	7

October 1933

	Cases
Actinomycosis:	
Minnesota	1
Anthrax:	
Michigan	1
Chicken pox:	
Arizona	15
California	765
Iowa	80
Maryland	106
Michigan	568
Minnesota	358
Montana	228
New York	789
North Carolina	39
Ohio	752
Puerto Rico	35
South Carolina	14
West Virginia	89
Wisconsin	884
Conjunctivitis:	
Arizona	34
Dengue:	
South Carolina	4
Diarrhea:	
Maryland	32
South Carolina	379
Diarrhea and enteritis:	
Ohio (under 2 years)	30
Dysentery:	
Arizona	5
California (amebic)	16
California (bacillary)	55
Iowa	3
Maryland	42
Minnesota	3
Minnesota (amebic)	3
Montana	1
New York	56
Ohio	7
Puerto Rico	169
South Carolina (amebic)	1
Food poisoning:	
California	61
Ohio	47
German measles:	
Arizona	2
California	24
Maryland	2
Montana	4
New York	29
North Carolina	8
Ohio	7
Wisconsin	17
Granuloma, coccidioidal:	
California	4
Hookworm disease:	
Maryland	1
South Carolina	70
Impetigo contagiosa:	
Arizona	40
Iowa	2
Maryland	159
Montana	12
Lead poisoning:	
Maryland	1
Ohio	31

October 1933—Contd.

	Cases
Leprosy:	
Puerto Rico	1
Lethargic encephalitis:	
California	2
Iowa	13
Michigan	8
Minnesota	1
New York	16
Ohio	8
South Carolina	3
West Virginia	1
Wisconsin	1
Mumps:	
Arizona	10
California	765
Iowa	10
Maryland	31
Michigan	111
Montana	3
Ohio	109
Puerto Rico	96
South Carolina	19
West Virginia	2
Wisconsin	45
Ophthalmia neonatorum:	
California	4
Iowa	1
Maryland	1
New York	2
North Carolina	1
Ohio	83
Puerto Rico	9
South Carolina	12
Wisconsin	3
Paratyphoid fever:	
California	3
Michigan	2
Minnesota	1
New York	11
North Carolina	2
South Carolina	12
Psittacosis:	
California	1
Puerperal septicemia:	
Ohio	2
Puerto Rico	8
Rabies in animals:	
California	63
Maryland	1
South Carolina	13
Rabies in man:	
Michigan	2
Rocky Mountain spotted fever:	
North Carolina	1
Scabies:	
Maryland	22
Montana	14
Septic sore throat:	
California	1
Michigan	46
Montana	4
New York	19
North Carolina	19
Ohio	171
Silicosis:	
Montana	2
Ohio	1

October 1933—Contd.

	Cases
Tetanus:	
California	7
Iowa	1
Maryland	3
New York	7
Ohio	1
Puerto Rico	15
Tetanus, infantile:	
Puerto Rico	13
Trachoma:	
Arizona	154
California	26
Maryland	1
Montana	46
Ohio	8
Puerto Rico	57
Trichinosis:	
California	13
Maryland	2
Michigan	1
New York	24
Tularaemia:	
California	1
Michigan	1
Minnesota	9
Ohio	1
West Virginia	1
Wisconsin	2
Typhus fever:	
North Carolina	3
South Carolina	5
Undulant fever:	
Arizona	1
California	11
Iowa	4
Maryland	3
Michigan	5
Minnesota	7
Montana	3
New York	12
North Carolina	3
Ohio	4
South Carolina	1
West Virginia	1
Wisconsin	10
Vincent's infection:	
Maryland	16
Michigan	22
Montana	7
New York	[1] 71
Whooping cough:	
Arizona	47
California	799
Iowa	96
Maryland	211
Michigan	592
Minnesota	160
Montana	33
New York	1,208
North Carolina	399
Ohio	471
Puerto Rico	164
South Carolina	102
West Virginia	82
Wisconsin	808

[1] Exclusive of New York City.

WEEKLY REPORTS FROM CITIES

City reports for week ended Nov. 11, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	2	------	1	0	2	0	0	0	1	0	27
New Hampshire:											
Concord	0	------	0	0	1	0	0	0	0	0	7
Manchester	0	------	1	3	1	1	0	0	0	0	5
Nashua	0	------	0	0	0	12	0	0	0	12	--------
Vermont:											
Barre	0	------	0	28	0	0	0	2	0	0	3
Burlington	3	------	0	0	0	0	0	0	0	5	14
Massachusetts:											
Boston	7	------	0	36	15	24	0	12	0	39	197
Fall River	1	------	0	1	2	6	0	3	0	0	36
Springfield	0	------	0	0	0	2	0	1	0	14	21
Worcester	0	2	0	88	7	3	0	3	1	8	47
Rhode Island:											
Pawtucket	3	------	0	0	0	1	0	0	0	0	14
Providence	1	------	0	0	2	7	0	1	1	12	65
Connecticut:											
Bridgeport	0	------	0	0	2	2	0	0	0	0	35
Hartford	1	1	0	0	2	17	0	1	0	0	31
New Haven	0	------	0	0	1	4	0	0	1	3	42
New York:											
Buffalo	2	------	1	10	24	12	0	6	0	16	118
New York	27	27	8	9	138	95	0	88	11	92	1,385
Rochester	1	------	0	2	4	19	0	0	0	2	55
Syracuse	0	------	0	0	2	0	0	2	4	31	42
New Jersey:											
Camden	5	1	1	0	1	6	0	0	0	0	20
Newark	1	6	1	2	9	1	0	5	0	23	76
Trenton	1	------	1	0	5	1	0	0	0	6	42
Pennsylvania:											
Philadelphia	4	8	9	54	22	65	0	22	2	28	433
Pittsburgh	6	------	2	2	18	23	0	4	0	21	141
Reading	0	------	0	0	0	3	0	0	0	6	22
Ohio:											
Cincinnati	12	------	1	17	5	24	0	8	0	9	100
Cleveland	12	37	1	2	8	33	0	10	0	54	162
Columbus	4	------	0	1	3	20	0	2	0	1	59
Toledo	6	------	0	2	2	30	0	3	0	8	60
Indiana:											
Fort Wayne	2	------	0	0	1	7	0	0	0	0	20
Indianapolis	9	------	0	2	12	9	0	4	0	4	--------
South Bend	0	------	0	0	1	3	0	0	0	1	10
Terre Haute	1	------	0	1	0	0	0	0	0	0	12
Illinois:											
Chicago	2	3	1	4	43	128	0	25	2	60	673
Springfield	0	------	0	2	1	6	0	11	0	3	19
Michigan:											
Detroit	9	1	2	6	18	49	0	22	0	80	220
Flint	2	------	0	2	3	19	0	2	0	5	15
Grand Rapids	2	------	0	0	7	5	0	0	1	0	42
Wisconsin:											
Kenosha	2	------	0	1	0	6	0	0	1	5	5
Madison	0	------	------	0	------	1	0	1	0	19	24
Milwaukee	4	1	1	0	3	13	0	2	2	27	80
Racine	0	------	0	1	0	2	0	0	0	8	12
Superior	0	------	0	0	0	1	0	0	0	5	4
Minnesota:											
Duluth	0	------	1	0	0	7	0	0	0	0	18
Minneapolis	5	------	1	0	6	10	1	0	1	5	91
St. Paul	0	------	0	0	3	5	0	3	3	5	50
Iowa:											
Des Moines	3	------	------	0	------	18	0	------	0	0	22
Sioux City	1	------	------	0	------	1	0	------	0	0	--------
Waterloo	3	------	------	0	------	0	0	------	0	3	--------
Missouri:											
Kansas City	4	------	1	1	12	19	0	5	0	7	96
St. Joseph	2	------	0	0	2	3	0	1	0	0	20
St. Louis	23	------	1	14	6	18	0	8	2	9	202
North Dakota:											
Fargo	0	------	0	2	1	5	0	0	0	0	4
Grand Forks	0	------	0	0	0	0	0	0	0	0	--------
South Dakota:											
Aberdeen	0	------	0	2	0	0	0	0	0	0	--------

City reports for week ended Nov. 11, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Nebraska:											
Omaha	1		0	1	6	9	3	0	0	6	56
Kansas:											
Topeka	0		0	0	1	4	0	0	0	1	12
Wichita	0		0	0	1	14	0	0	0	0	32
Delaware:											
Wilmington	0		0	1	0	0	0	0	0	3	34
Maryland:											
Baltimore	4	2	2	1	20	51	0	7	0	59	230
Cumberland	4		0	0	0	5	0	1	0	0	10
Frederick	0		0	0	0	3	0	0	0	0	1
District of Col.:											
Washington	14	1	1	7	6	10	0	9	0	10	139
Virginia:											
Lynchburg	3		0	1	0	2	0	1	0	1	10
Richmond	4		2	0	4	5	0	1	3	0	49
Roanoke	1		0	0	0	8	0	0	0	0	18
West Virginia:											
Charleston	8	5	1	0	[1]4	[1]4	0	1	0	0	30
Huntington	3		0	0	0	15	1	0	0	0	
Wheeling	0	2	0	0	2	7	0	0	0	1	20
North Carolina:											
Raleigh	0		0	0	0	10	0	1	0	0	11
Wilmington	0		0	1	1	2	0	1	0	0	9
Winston-Salem	6	1	0	40	3	4	0	2	0		19
South Carolina:											
Charleston	0	13	0	0	7	0	0	2	0	0	24
Columbia											
Greenville	0		0	1	1	1	0	0	0	0	9
Georgia:											
Atlanta	9	5	1	3	7	7	0	8	0	3	66
Brunswick	0		0	0	1	0	0	0	0	0	8
Savannah	1	7	0	0	1	1	0	2	0	0	39
Florida:											
Miami	0		0	0	0	0	0	2	0	3	
Tampa	1		0	0	0	2	0	2	0	0	23
Kentucky:											
Ashland	5			0		0	0		2	0	
Lexington	5		0	0	2	4	0	2	0	0	14
Louisville	27		0	0	10	9	0	6	0	1	80
Tennessee:											
Memphis	8		0	0	13	14	0	5	4	3	100
Nashville	4		1	0	1	11	0	2	0	0	40
Alabama:											
Birmingham	10	1	2	1	5	5	0	4	1	2	66
Mobile	3		0	0	0	0	0	1	0	0	24
Montgomery	6			0		1	0		0	2	
Arkansas:											
Fort Smith	8			0		0	0		0	0	
Little Rock	1		0	0	1	2	0	1	0	0	4
Louisiana:											
New Orleans	9	3	3	0	9	4	0	6	0	0	140
Shreveport	5		0	0	2	4	0	0	0	0	35
Oklahoma:											
Tulsa	8			3		2	0		1	0	
Texas:											
Dallas	31	4	4	0	5	5	0	0	1	0	70
Fort Worth	12		2	0	2	8	1	0	0	1	39
Galveston	1		0	0	2	0	0	2	0	0	14
Houston	18		0	1	4	3	0	4	0	0	71
San Antonio	5		2	0	4	4	0	9	3	0	61
Montana:											
Billings	1		0	0	0	2	0	0	0	0	9
Great Falls	0		0	0	0	0	0	0	0	1	9
Helena	0		0	0	0	0	0	0	0	0	6
Missoula	0		0	0	0	3	0	0	0	0	4
Idaho:											
Boise	0		0	1	1	0	2	0	0	0	10
Colorado:											
Denver	2	21	0	6	5	19	0	2	0	60	72
Pueblo	0		0	0	0	1	0	1	1	0	4

[1] 1 imported

City reports for week ended Nov. 11, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
New Mexico:											
Albuquerque	1	------	0	0	1	0	0	5	0	1	18
Utah:											
Salt Lake City	0	------	1	87	3	7	0	1	0	6	35
Nevada:											
Reno	0	------	0	0	0	1	0	0	0	0	8
Washington:											
Seattle	0	------	------	1	3	9	0	4	3	16	78
Spokane	0	2	2	46	------	5	2	1	0	0	30
Tacoma	0	------	0	0	5	1	0	1	0	1	29
Oregon:											
Portland	0	1	1	0	1	22	1	3	0	0	56
Salem	0	2	0	0	0	0	0	0	0	3	0
California:											
Los Angeles	20	22	2	6	19	55	2	19	0	55	296
Sacramento	1	------	0	3	2	3	0	4	1	1	29
San Francisco	3	1	0	1	6	5	0	4	0	25	149

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				District of Columbia:			
Worcester	0	0	1	Washington	0	1	0
New York:				North Carolina:			
New York	2	0	1	Winston-Salem	1	0	0
Rochester	0	0	1	Georgia:			
Syracuse	0	0	1	Atlanta	2	0	0
Pennsylvania:				Kentucky:			
Philadelphia	1	0	0	Lexington	0	0	1
Ohio:				Tennessee:			
Cleveland	0	0	1	Memphis	0	1	0
Illinois:				Nashville	0	0	2
Chicago	6	1	1	Texas:			
Minnesota:				San Antonio	0	0	1
Duluth	0	0	1	Washington:			
Minneapolis	0	0	2	Seattle	0	0	1
Iowa:				Tacoma	1	1	1
Sioux City	1	0	0	California:			
Missouri:				Los Angeles	0	2	2
St. Louis	1	0	1	San Francisco	1	0	0
Maryland:							
Baltimore	0	0	1				

Lethargic encephalitis.—Cases: Pittsburgh, Pa., 1; Cleveland, 1; Kansas City, Mo., 1; St. Louis, 1; Salt Lake City, 1.

Pellagra.—Cases: Wilmington, N.C., 1; Winston-Salem, N.C., 1; Charleston, S.C., 1; Atlanta, 1; Memphis, 1; New Orleans, 1.

Rabies in man.—Greenville, S.C., 1 death.

Typhus fever.—Cases: New York, 1; Baltimore, 1; Wilmington, N.C., 1; Atlanta, 3; Savannah, 1; Montgomery, Ala., 2.

FOREIGN AND INSULAR

CANADA

Ontario Province—Communicable diseases—Four weeks ended October 28, 1933.—The Department of Health of the Province of Ontario, Canada, reports certain communicable diseases for the 4 weeks ended October 28, 1933, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Actinomycosis	1		Paratyphoid fever	15	1
Cerebrospinal meningitis	3	3	Pneumonia		85
Chicken pox	309		Poliomyelitis	11	
Diphtheria	29	3	Scarlet fever	210	
Dysentery	3		Septic sore throat	6	
Erysipelas	5		Syphilis	259	1
German measles	5		Tetanus		1
Gonorrhea	201		Trench mouth	1	
Influenza	25	1	Tuberculosis	147	39
Jaundice (infectious)	16		Tularaemia	1	
Lethargic encephalitis	3	2	Typhoid fever	65	4
Measles	29		Undulant fever	17	
Mumps	82		Whooping cough	346	3

CUBA

Habana—Communicable diseases—Four weeks ended November 4, 1933.—During the 4 weeks ended November 4, 1933, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	36	3	Scarlet fever	1	
Malaria	151	3	Tuberculosis	27	
Poliomyelitis	2	1	Typhoid fever	40	3
Rabies	1	1			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Nov. 24, 1933, pp. 1431–1442. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Dec. 29, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Philippine Islands.—During the week ended November 18, 1933, cholera was reported in the Philippine Islands as follows: Bohol Province—Antequera, 2 cases, 2 deaths; Carmen, 1 case, 1 death; Clarin, 1 case, 1 death; Inabanga, 9 cases, 4 deaths; Jetafe, 3 cases, 2 deaths;

Mabini, 2 cases; Tubigon, 21 cases, 15 deaths. Cebu Province—Cebu City, 4 cases, 1 death; Naga, 1 case, 1 death; Talisay, 2 cases, 2 deaths.

Plague

Argentina.—During the month of October 1933 plague was reported in Argentina as follows: Recreo, Catamarca Province, 5 cases, 2 deaths; Santa Fe, 1 case.

Hawaii Territory.—During the week ended November 11, 1933, plague-infected rats were found in Hamákua District, island of Hawaii, as follows: Paauilo, 1 plague-infected rat on November 10 and Pohakea Homesteads, 1 plague-infected rat on November 7.

Yellow Fever

Senegal.—During the period October 1 to 10, 1933, yellow fever was reported in Senegal as follows: 1 case and 1 death at Bakel and 1 case and 1 death at Kaffrine.

UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

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IN THIS ISSUE

An Additional Report on Malaria Among Narcotic Addicts
Specificity of Immunity Elicited by Mouse Sarcoma 180
Deaths in Large Cities During Week Ended November 18
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of public health.

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PUBLIC HEALTH REPORTS

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MALARIA IN NARCOTIC ADDICTS AT THE UNITED STATES PENITENTIARY ANNEX, FORT LEAVENWORTH, KANS.

By C. K. Himmelsbach, *Assistant Surgeon, United States Public Health Service*

The epidemiology of malaria has taken on a new factor since March 14, 1932, when Geiger (1), in an unpublished letter to the Surgeon General of the United States Public Health Service, indicated the nonsterile hypodermic syringe as a possible agent for the transmission of malaria among narcotic addicts. Nickum (2), in May 1933, reported a similar outbreak of malaria in Omaha, Nebr., where the syringe was incriminated as the agent of transmission among habitues. More recently Faget (3) reported five probable cases of needle transmission of malaria among the addicts of New Orleans, La. Flaxman (4) reports cases of malaria among addicts in Chicago, which were probably transmitted by the hypodermic needle.

At the time of writing there are 28 inmates out of 1,596 (1.75 percent) at the United States penitentiary annex, Fort Leavenworth, Kans., who have had definite clinical and laboratory diagnoses of malaria since commitment to this institution. These men have all been interviewed, and their epidemiologic case histories automatically fall into three groups:

Group I. Those in which it is probable that the hypodermic needle was the agent of transmission.
Group II. Those in which it is possible that the needle played this role.
Group III. Recurrences.

The purpose of this investigation was twofold: First, to establish more definitely the incidence of needle transmission malaria among addicts; and, second, to determine the cause of so much malaria in this institution.

Although it is obvious that one cannot attach too much significance to case histories, it is felt that the majority of these are reliable. This was taken into consideration in classifying them. These reports have been abstracted to contain only such information as is considered essential.

Only those deemed highly probable were included in group I. Group II contains only those cases in which it is quite likely that the needle played the role of transmission agent, but could not be clearly established because of vague statements, or because *Anopheles* could not be ruled out. Those cases which had had clinical malaria at any time previously, and those whose histories were considered undependable were placed in group III.

GROUP I

Case 1.—White male, age 52, clerk, morphine addict, received June 10, 1933, from Chicago. On June 24, 1933, a clinical and laboratory diagnosis of tertian malaria was made. He had not been south nor had he had clinical malaria before. He had been confined to jail during the entire preceding year. Illegitimate narcotics were available from time to time, and at such times the drug was dissolved in bulk, introduced into a medicine dropper or syringe and this instrument was passed from man to man with no attempt at sterilization between intravenous injections. Several other addicts in the Chicago jail had chills and fever, and in December 1932, case 1 manifested the classical response to a tertian infestation.

Case 2.—White male, age 48, clerk, heroin and morphine addict, received May 27, 1933, from Chicago. A positive diagnosis of tertian malaria was made on July 4, 1933. He had been in a Chicago jail with ca e 1 with whom he had frequently shared "shots." He had never had clinical malaria before, although he had "followed the horses all over the country" for at least twenty years. He had never taken narcotics intravenously, always making subcutaneous or intramuscular injections. Case 1 had always used the intravenous route.

Case 3.—White male, age 52, clerk, addicted to the use of opium, morphine, and heroin, received June 10, 1933, from Chicago. A positive diagnosis of tertian malaria was made on July 11, 1933. He had never had malaria before and had never used narcotics by the intravenous route before commitment to the Chicago jail. He frequently used the same "outfit" immediately after cases 1 and 2.

Case 4.—White male, age 38, waiter, morphine and heroin addict, received December 31, 1932, from St. Paul, Minn. On February 15, 1933, a positive diagnosis of tertian malaria was made. He was committed to jail in St. Paul along with two Southern addicts, who were having chills and fever at the time. They frequently shared "shots", all of which were taken intravenously. He had never been south and had never had malaria before.

Case 5.—White male, age 38, clerk, morphine addict, received April 26, 1933, from Kansas City, Mo. On March 21, 1933, while in Kansas City, he first had chills and fever. He was treated with quinine. A week or ten days earlier he had shared his syringe with an addict who was having chills and fever every other day. Both used the intravenous route. A positive diagnosis of tertian malaria was made here May 2, 1933. He had never had symptoms of malaria before March 21, 1933.

Case 6.—White male, age 32, waiter, morphine addict, received October 31, 1931, from St. Paul, Minn. A positive diagnosis of tertian malaria was made May 17, 1932. While in jail in July 1931, in St. Paul, he used the same "outfit" used by an addict who was having chills and fever and immediately after use by the latter. Both used the intravenous route. Two weeks later, he had his first chills and fever, diagnosed as malaria, and was treated with quinine. He had never had malaria before the attack in 1931. This was his first recurrence.

Case 7.—White male, age 46, fireman, opium, morphine, and heroin addict, received October 23, 1932, from Tyler, Tex. During the autumn and fall of 1931 he was tramping with a fellow addict who was having chills and fever every three days. He broke his needle and was forced to use his friend's "outfit." One week later he began having chills and fever which responded to quinine. The first recurrence was after withdrawal here, and a positive diagnosis of quartan malaria was made December 31, 1932.

Case 8.—White male, age 20, laborer, heroin addict, received January 8, 1933, from New Orleans, La. On January 15, 1933, a positive diagnosis of estivo-autumnal malaria was made. In December 1932, while on a craw-fishing party with a number of other heroin addicts he shared intravenous "shots" with all the others. Several of them had chills and fever. The whole group had only one tin cup and one eye dropper, with needle attached, for the purpose of dissolving and administering the solution of heroin. Swamp water was used as a diluent and no attempt at sterilization was made. Several days after being committed to jail in New Orleans, he started having chills and fever. He had never had symptoms of malaria before.

It is interesting to note that this is our only case of estivo-autumnal malaria, and that four out of five of the cases reported by Faget (3) among New Orleans addicts were of the estivo-autumnal variety. Case 8 would not divulge the initials of the men with whom he had shared heroin and would not admit recognition of any of the cases reported by Faget.

GROUP II

Case 9.—Mexican male, age 28, laborer, heroin addict, received April 26, 1933, from El Paso, Tex. While in jail in El Paso, one month before having been sent here, he frequently shared "shots" with his brother, case 28, who was having chills and fever, and he shortly afterward developed them himself. He was treated with quinine. Although he had lived in a malarial country all his life, case 9 had never had malaria before. He has had one recurrence here, which was diagnosed tertian malaria May 9, 1933.

Case 10.—Negro male, age 36, morphine addict, received August 12, 1932, from Phoenix, Ariz. For a few days, about one week before having been committed to jail there, he had been sharing intravenous "shots" with a fellow addict, who was having chills and fever. He developed chills and fever while in jail. A positive diagnosis of tertian malaria was made August 22, 1932. Patient thinks he had malaria in 1911 but had had no recurrences until this time.

Case 11.—White male, age 43, showman, opium and morphine addict, received January 21, 1933, from Chicago. A positive diagnosis of quartan malaria was made here March 9, 1933. He used morphine intravenously only during the last few months of liberty, and, although he shared with others occasionally, he does not remember that any of his intimates had chills and fever. He said that he never had malaria before.

Case 12.—White male, aged 34, cook, morphine addict, received February 25, 1933, from Texas. On March 4, 1933, a positive diagnosis of tertian malaria was made. The preceding eleven months had been spent in jail at Tyler, Tex. Although he had frequently lived in malarial districts, he thinks he had never had clinical malaria. While in jail he shared intravenous "shots" with addicts who were having chills and fever and not long thereafter he had like symptoms himself.

Case 13.—White male, aged 47, gardener, native of Baton Rouge, La., morphin and heroin addict, received April 15, 1933, from New Orleans, La. A positive

diagnosis of tertian malaria was made April 29, 1933. He does not remember having had malaria previously and admits to sharing intravenous "shots" shortly before commitment. He does not know that any of his associates had malaria.

Case 14.—White male, age 57, nurse, heroin and morphine addict, received May 11, 1933, from Indianapolis, Ind. A positive diagnosis of tertian malaria was made June 1, 1933. In March he had frequently shared intravenous "shots" with several addicts in Chicago, one of whom was from the South. Withdrawal was effected while in jail in Indiana, during April 1933. He had never had malaria before and had no symptoms before his arrival here.

This man may have been associated with the group of Chicago addicts mentioned by Flaxman (4). There seems to be no doubt that malaria was present among Chicago addicts in the spring of 1933. However, the period of incubation in this case is quite long and for this reason the case is placed in group II.

GROUP III

Case 15.—White male, Italian, age 34, steam fitter, opium and morphine addict, received April 30, 1932, from Kansas City, Mo. On September 14, 1933, a positive diagnosis of tertian malaria was made. Patient thinks he had malaria in 1929 while in Oklahoma. He admits sharing intravenous "shots" before admission here, while in Kansas City, but not with known malarial addicts.

Case 16.—Indian male, age 51, tailor, cocaine and morphine addict, received from Detroit, Mich., July 14, 1930. He has not been out of this institution since that date. May 12, 1933, a positive diagnosis of tertian malaria was made. He states that he had malaria in 1923 while in Kansas City, that he had never had it before, and that he had no recognized recurrences until May 12, 1933. He feels that it is possible that he first contracted malaria through sharing the hypodermic syringe with malarial addicts, but is not sure.

Case 17.—White male, age 44, laborer; opium, morphine, and heroin addict; received April 19, 1933, from Topeka, Kans. On May 29, 1933, a positive diagnosis of tertian malaria was made. At the age of 15 he had malaria and has had no recurrence since then. Addiction has been present since the age of 19; and although he used the intravenous route, he never shared narcotics nor lent his syringe.

Case 18.—White male, age 31, dentist, morphine addict, received October 30, 1932, from New Orleans, La. On May 26, 1933, a positive diagnosis of tertian malaria was made. He has had recurrences of malaria every year as long as he can remember. He has never taken morphine intravenously, nor has he shared intravenous "shots" or lent his syringe.

Case 19.—White male, age 28, waiter, heroin addict, received February 12, 1933, from Oklahoma City, Okla. On April 26, 1933, a positive diagnosis of tertian malaria was made. He had had malaria two years before admission and had lived in malarial country all his life. He has never shared "shots," but has used the syringe after others. He does not know that any of his associates had malaria.

Case 20.—White male, age 40, fireman, heroin addict, received January 8, 1933, from Detroit, Mich. A positive diagnosis of tertian malaria was made May 12, 1933. Patient states that he had malaria in Tennessee when quite young and has had mild recurrences as long as he can remember. He has never shared intravenous "shots" with known malarial addicts.

Case 21.—White male, age 48, salesman, received here November 17, 1932, from Kansas City, Mo. A positive diagnosis of tertian malaria was made March 21, 1933. He is not an addict and never used opiates in any form. In 1908, while in South Carolina, he contracted malaria and has had frequent recurrences since then.

Case 22.—White male, age 39, clerk, addicted to the use of opium, heroin, and morphine, received February 5, 1933, from Detroit, Mich. On March 1, 1933, a positive diagnosis of tertian malaria was made. He states that 10 years previously he developed malaria while in the South and has had it "off and on" ever since then. He takes narcotics intravenously sometimes and has shared "shots" frequently, but never, to his knowledge, with malarial addicts and does not know of any cases of malaria which resulted from contamination of the syringe by his blood.

Case 23.—White male, age 39, salesman, heroin and morphine addict, received June 21, 1933, from Mobile, Ala. On July 10, 1933, a positive diagnosis of tertian malaria was made. He first had malaria in 1918, while in Italy, and has had no recurrences since then. During the past year he has been using narcotics intravenously but has never shared "shots" and has been very careful about sterilizing his syringe.

Case 24.—White male, age 28, bookkeeper, morphine and heroin addict, received January 26, 1933, from El Paso, Tex. A positive diagnosis of tertian malaria was made February 6, 1933. He had had malaria "off and on" for two or three years before coming here, which he thinks he contracted while in western Louisiana and eastern Texas. Although he uses the intravenous route, he has never lent his syringe nor shared "shots."

Case 25.—White male, age 28, carpet layer, morphine addict, received July 31, 1932, from Fort Worth, Tex. On February 2, 1933, a positive diagnosis of tertian malaria was made. He has had malaria before and has had recurrences within the last two years. He uses the intravenous route but has never shared any "shots" and does not recall having ever used a syringe without sterlizing it.

Case 26.—White male, age 39, cook, morphine addict, received December 17, 1929, from the United States Penitentiary, McNeil's Island. Diagnoses of malaria were made June 4, 1930, and October 11, 1930. Previous to his sentence here he had been in prison in California for 5 years and during this whole period had never received any narcotics. He does not think he ever had malaria before 1930.

Case 27.—White male, age 35, boilermaker, cocaine and heroin addict, received January 8, 1933, from Detroit, Mich. On January 13, 1933, a positive diagnosis of quartan maleria was made. Patient does not think he ever had malaria before. He has never been South. He denies sharing intravenous "shots" and has never known anyone who had malaria. He became ill in June 1932, in Detroit, and the illness was diagnosed as typhoid fever in Henry Ford Hospital. He thinks he might have had malaria at the same time.

Case 28.—Mexican male, age 28, heroin addict, received June 10, 1933, from El Paso, Tex. A positive diagnosis of tertian malaria was made June 12, 1933. He had malaria in 1929 and had his first recurrence while in jail in El Paso before being sent here. He was given some quinine while there.

Case 29.—White male, age 22, laborer, morphine addict, received January 31, 1932, from Texas. While working in a construction camp he contracted malaria; and since quinine seemed to be ineffective in his case, he resorted to and later became addicted to the use of opiates. He has never had any symptoms of malaria since that time.

DISCUSSION

It seems to be rather definitely established that the transmission of malaria among narcotic addicts does occur through the medium of the hypodermic needle. The term "hypodermic" is not used here in its strictest sense, since most of the cases resort to the intravenous route. The sharing of "shots", the lack of sterilization between injections, and the use of the intravenous technique by the "donor" appear to be essential conditions for "needle" transmission of malaria. It would seem that the "recipient" may make subcutaneous or intramuscular injections.

Case 29 brought out the interesting possibility that narcotics taken in large quantities might be toxic to the malaria plasmodium. Several known malarial addicts stated that they had recurrences only during abstinence. Considerable doubt is thrown on this hypothesis by Macht and Fisher (5) (1917) and later by Bills and Macht (1924), who found the morphine group relatively ineffective against protozoa. Macht and Weiner (6) (1918) found both the papaverine and morphine groups to be inefficient, *in vivo* (rats), against *Trypanosoma brucei* infestation. Pick and Wasiky (7) found papaverine to be ineffective against amebic dysentery. It is no doubt true that continued use of opiates may control the symptoms to a large extent, but it is not likely that opiates exert any depressant action on the plasmodium. It has been observed (8) that resistance to infection is low during withdrawal.

Among the cases in group III will be noted several who deny previous malaria or who have not had recurrences for many years (15, 16, 17, 23, 26, and 27). Reinfection from fresh cases was considered. A few mosquitoes were caught in one of the cell houses and one of these was an *Anopheles quadrimaculatis*. None was noticed before May 1, 1933; and altogether not more than four have been seen. Since we have present the human reservoir, this might account for some of the cases in group III.

TABLE 1.—*Data indicating possible association among certain cases*

Type of disease and case number	Wing number	Date of admission	Date of diagnosis	Type of disease and case number	Wing number	Date of admission	Date of diagnosis
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25	7	July 31, 1932	Feb. 2, 1933	18	4	Oct. 30, 1932	May 26, 1933
24	4	Jan. 26, 1933	Feb 6, 1933	17	6	Apr 19, 1933	May 29, 1933
4	4	Dec. 31, 1932	Feb. 15, 1933	14	4	May 11, 1933	June 1, 1933
22	6	Feb. 5, 1933	Mar 1, 1933	1	6	June 10, 1933	June 24, 1933
12	6	Feb. 25, 1933	Mar. 4, 1933	2	6	May 21, 1933	July 4, 1933
21	6	Nov. 17, 1932	Mar 21, 1933	3	6	June 10, 1933	July 11, 1933
19	6	Feb. 12, 1933	Apr. 26, 1933	23	6	July 21, 1933	Aug. 10, 1933
13	6	Apr. 15, 1933	Apr. 29, 1933	15	4	Apr. 30, 1932	Sept. 14, 1933
5	4	Apr. 26, 1933	May 2, 1933	Quartan:			
9	6	Apr. 26, 1933	May 9, 1933	7	6	Oct. 23, 1932	Dec. 31, 1932
20	7	Jan 8, 1933	May 12, 1933	27	4	Jan. 8, 1933	Jan. 13, 1933
16	6	July 14, 1930	May 12, 1933	11	6	Jan. 21, 1933	Mar. 9, 1933

The facts presented in table 1 indicate a possible association among some of the cases. The incidence of cases in wing 6 was high from February 2, 1933, to September 14, 1933. Since the mosquito season is over at the time of this report it will be impossible to determine this year whether they were carrying the infestation or not. The question of penitentiary irregularities naturally arises, but these were not investigated.

Since several cases came here from Illinois, Michigan, and Missouri, it was interesting to note the reported (9) incidence of malaria in these States, from December 1932 through March 1933, as shown in table 2. There is also shown the incidence of cases of malaria diagnosed after arrival, in inmates who had come from those States during the period indicated.

TABLE 2.—*Incidence of malaria in Illinois, Michigan, and Missouri*

	Illinois	Michigan	Missouri
December 1932	3	5	3
January 1933	3	2	1
February 1933	1	1	0
March 1933	1	3	0
Total	8	11	4
Cases [1]	2	3	1

[1] Cases of malaria detected at the United States penitentiary annex in which the patient had either been received from those States or had contracted the disease there during the period indicated.

It appears that the incidence of drug addiction in cases of "off season" malaria in these States is high, especially when one considers that each one of our cases must have contracted the disease from a fellow malarial addict there.

SUMMARY

The incidence of malaria in the United States penitentiary annex, Fort Leavenworth, Kans., indicated an epidemiologic survey. Out of a total population of 1,596, twenty-eight (1.75 percent) have had malaria since their commitment here—25 since December 31, 1932. Eight cases (28.6 percent of the cases) very probably resulted from needle transmission, and in six cases (21.4 percent) this was quite possible; while 14 cases (50 percent) were either recurrent or unexplained. The presence of the *Anopheles* probably accounts for some of them; but, unfortunately, no mosquitoes were available for dissection at the time of the report.

It appears that the incidence of malaria in nonmalarial districts, in the "off season" can be accounted for in many instances by needle transmission among narcotic addicts. We plan to make malaria concentration smears on all new admissions. Narcotic addicts in general should be warned of the malaria hazard and the mode of transmission as a preventive measure against an epidemic.

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THE SPECIFICITY OF IMMUNITY ELICITED BY MOUSE SARCOMA 180

By H. B. ANDERVONT, *Biologist, Office of Field Investigations of Cancer, United States Public Health Service*

In a previous communication (1), evidence was presented showing that a single caudal inoculation of mouse sarcoma 180 induces concomitant immunity in about 60 percent of adult female stock mice. In addition, it was shown that mice immune to sarcoma 180 are also immune to adenocarcinoma 63. Hence, the immunity is not specific. The present report deals with the continuation of studies bearing on cross-immunity between sarcoma 180 and other transplantable mouse tumors, and with experiments pertaining to concomitant immunity elicited in mice following caudal inoculation of tumors other than sarcoma 180.

TUMOR STRAINS, EXPERIMENTAL ANIMALS, AND METHODS

Four strains of mouse tumors were utilized in these experiments. The first, sarcoma 180, is characterized by its remarkable power of proliferation in practically all strains of mice. The second, sarcoma 37 (2), arose in the stroma of a transplantable carcinoma and is known as an extremely rapidly growing tumor. The third, carcinoma 206 (3), is noted for its high percentage of spontaneous regression, after attaining considerable size. Sarcoma 37 and carcinoma 206 were selected for these studies because Russell (4) has shown that both possess the power of inducing a high degree of concomitant resistance. The fourth tumor strain, an adenocarcinoma, was discovered in this laboratory as a spontaneous tumor arising within a female stock mouse of unknown ancestry. The original growth was transplanted by grafts into 19 mice, of which 2 developed tumors. Transplants from one of these were successful in 14 out of 15 mice. The tumor retained

this high proliferative power during 27 consecutive passages, during which tumors grew progressively in 95 percent of all inoculated animals, rarely metastasized, and usually killed the mice within 6 to 8 weeks.

With the conclusion of the 27 passages, the tumor suddenly lost its malignancy; and, in spite of efforts to enhance its growth energy by using young animals, embryo mash, and very susceptible strains of mice, it was lost during the thirty-eighth passage. All the experiments recorded in this communication wherein this tumor was used were performed during the first 27 passages, when the tumor was extremely malignant. It is referred to as carcinoma A in the present paper.

Only adult female albino mice purchased from dealers were used in these experiments. In order to exclude variations in susceptibility as far as possible, animals from the same shipment were always used as controls.

The technique for tail inoculation has been described in detail elsewhere (1). Pieces of actively growing tumor were passed through a mincing machine and inserted into the tails of mice by means of a 1-cc tuberculin syringe and an 18-gage needle. Subcutaneous inoculation in the groin by the usual trocar technique was employed when testing for immunity. Any mouse surviving two such tests was considered immune.

EXPERIMENTAL OBSERVATIONS

CROSS-IMMUNITY EXPERIMENTS BETWEEN SARCOMA 180 AND CARCINOMA A

Experiment 1.—Twenty-two mice that had been inoculated caudally with sarcoma 180 and had survived two subsequent tests for immunity in the right groin were each reinoculated in the right groin with sarcoma 180 and at the same time given transplants of carcinoma A in the left groin. Twenty proved to be resistant to both tumors, while two grew the carcinoma only. The normal controls all grew sarcoma 180, and 9 of 10 normal controls developed carcinoma A.

Experiment 2.—Nineteen mice immunized to sarcoma 180, as described in experiment 1, were inoculated in the right groin with sarcoma 180 and in the left groin with carcinoma A. Fifteen were negative to both inoculations; 1 developed a tumor in both groins; 3 grew the carcinoma only. Ten normal control animals for sarcoma 180 were all positive, while 11 of 12 normal controls for carcinoma A developed progressively growing tumors.

It is seen in the two foregoing experiments that of 40 mice immune to sarcoma 180, 35 were also resistant to carcinoma A. In order to ascertain whether carcinoma A was capable of inducing concomitant immunity and, if so, whether the immunity was effective against sarcoma 180, the following experiments were performed.

Experiment 3.—Thirty mice were inoculated caudally with carcinoma A. All developed definite tumors within 2 weeks. The tails of these animals were not amputated, because the tumors had not attained sufficient size to warrant the procedure. In fact, every caudal growth had regressed completely 2 months after inoculation. This result confirmed the earlier findings (1) in respect to sarcoma 180, namely, that the tail was not so favorable a site as the groin for progressive growth of tumors. Two, and again at four, weeks after caudal inoculation the mice were tested for immunity in the usual manner. Of 29 survivors, 17 proved to be resistant. Of 24 normal control mice for the immunity tests, 22 were positive.

This experiment was repeated twice with the same results, so far as the appearance and regression of tail tumors were concerned. Forty-seven mice received the immunity test, of which 29 were immune. Of 48 normal controls for the tests, 44 responded with tumor growth.

The results of the three experiments show that the growth of carcinoma A within the tails of mice induced concomitant immunity in about 60 percent of the experimental animals.

The foregoing experiments yielded 46 mice immune to carcinoma A, which were tested for immunity to sarcoma 180 by groin inoculation. Only 6 of the animals were resistant to the sarcoma.

In another group of 3 experiments, 48 mice bearing 2-week-old carcinoma A in one groin were inoculated in the opposite groin with sarcoma 180. None was immune. Referring back to the experiments wherein the mice received an initial tail inoculation of carcinoma A, which receded, and two subsequent groin implantations of the same tumor for immunity tests, it is seen that about 13 percent were immune to sarcoma 180. The fact that none of the mice receiving but one inoculation of carcinoma A was immune to sarcoma 180 indicates that regression of caudal tumors, together with two subsequent groin implantations of carcinoma A, increased the resistance of the mice to such an extent that a few were also immune to the sarcoma.

CROSS-IMMUNITY EXPERIMENTS BETWEEN SARCOMA 180 AND CARCINOMA 206

Studies pertaining to the immunological relationship between sarcoma 180 and carcinoma 206 will not be described in detail, since they gave results similar to those obtained between sarcoma 180 and carcinoma A. In dealing with the ability of sarcoma 180 to immunize against carcinoma 206, three experiments were performed, in which a total of 60 mice resistant to sarcoma 180 were inoculated with carcinoma 206. It was found that 13, or about 20 percent, were not immune to the carcinoma.

Carcinoma 206 grew within the tails of mice and, similar to the action of carcinoma A, practically all the caudal growths receded.

In three experiments caudal growth of carcinoma 206 elicited concomitant immunity in 46 of 65 experimental animals. Thus, the earlier findings of Russell (4) were confirmed. However, of the 46 mice immune to carcinoma 206, only 6 were resistant to inoculation of sarcoma 180.

It is obvious that sarcoma 180 induces resistance to the two carcinomas, but neither carcinoma is able to immunize animals to such a degree that an appreciable number are also resistant to grafts of sarcoma 180.

CROSS-IMMUNITY EXPERIMENTS BETWEEN SARCOMA 180 AND SARCOMA 37

Experiment 4.—Sixty-five mice were inoculated caudally with sarcoma 180. Two weeks after inoculation, all the mice had large tail tumors. Their tails were then amputated and each mouse received a transplant of sarcoma 180 in the right groin. Two weeks later all the mice remaining tumor-free were given another implant of sarcoma 180 in the right groin. Thirty-nine of the animals were resistant to both test inoculations. These were inoculated in the left groin with sarcoma 37. Only 10 were immune.

The experiment was repeated twice and similar results were obtained. The material consisted of 120 mice, of which 88 were rendered immune to sarcoma 180. However, when tested for immunity to sarcoma 37, only 18 of these were found to be resistant. Thus, of 127 mice immune to sarcoma 180, only 28, or 22 percent, were also resistant to sarcoma 37.

Experiment 5.—Sixty-five mice were inoculated in the tail with sarcoma 37, and all developed tumors. Sarcoma 37 is noted for its rapidity of growth following subcutaneous inoculation, and the same may be said for its proliferative ability in the mouse's tail. Furthermore, the tail tumors have a pronounced tendency to extend beyond the base of the tail and invade the tissues of the posterior dorsal region. In this experiment 20 mice were discarded because of such extensions. Of the remaining 45 animals, 23 were immune to 2 inoculations of sarcoma 37 in the right groin.

In two subsequent experiments 56 mice were tested for immunity to sarcoma 37 following amputation of their tail tumors; 34 were immune. It is seen that growth of sarcoma 37 in the tails of mice induces concomitant resistance in about 60 percent of the animals.

All of these animals (57) immune to sarcoma 37 were given transplants of sarcoma 180 in the left groin. Only 4 were immune.

The foregoing results with the two sarcomas show that both elicit a fair degree of immunity against themselves, but neither is capable of producing any pronounced resistance against the other. It would appear as though sarcoma 180 induces a higher degree of immunity in mice than sarcoma 37.

SUMMARY

Acquired immunity induced by propagable tumors is known to be effective against other transplantable growths. The purpose of the experiments recorded in this paper was to continue the earlier investigations pertaining to the specificity of immunity elicited by sarcoma 180. The results attending the previous investigation (1) and those recorded in this communication may be summarized as follows:

1. Sarcoma 180 induces resistance in mice which is effective against carcinoma A, carcinoma 63, and carcinoma 206.

2. It fails to induce any pronounced resistance to sarcoma 37.

3. The growth of carcinoma A, carcinoma 206, or sarcoma 37 in the mouse's tail elicits concomitant immunity in a considerable percentage of animals. However, the resistance induced by any of these tumors is not effective against sarcoma 180.

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COURT DECISION RELATING TO PUBLIC HEALTH

City held liable for loss of fish in hatchery through pollution of stream.—(Washington Supreme Court; *Bales* v. *City of Tacoma*, 20 P. (2d) 860; decided Apr. 11, 1933.) The plaintiff, an operator of a fish hatchery, brought an action against the city of Tacoma to recover damages for the loss of fish through alleged contamination of the waters of a stream feeding his hatchery and to enjoin the continuation of the alleged nuisance causing the contamination. It was claimed that the stream was contaminated by sewage and garbage disposed of by the city. The trial court, sitting without a jury, awarded damages to the plaintiff and decreed injunctive relief. The supreme court, on appeal, sustained this action of the lower court. Portions of the appellate court's opinion follow:

* * * After a careful consideration of all the evidence, we are forced to the conclusion that the findings of the court in respect to the city's maintaining a nuisance are well supported by the evidence and furnish no ground for disturbance on appeal. [Case cited.]

Appellant contends that the damages allowed by the court are excessive. The court allowed nothing for loss of use of the hatchery. The damages were confined strictly to the loss of fish, and the amount allowed is well within the evidence.

* * * That the respondent was damaged in fact is not disputed; that the damage was occasioned by appellant is supported by the preponderance of the

evidence as found by the court; and that the amount was rested upon evidence of reasonable certainty we have no doubt. * * *

By our decisions we are committed to the rule that an injured party may maintain an equitable action to abate such nuisance [a public nuisance which is specially injurious to a private person]. [Cases cited.]

A municipal corporation is not immune from an action for damages nor from one to abate a nuisance. [Citations.]

The injuries sustained by respondent were special to himself, differing from those affecting the general public. He was, therefore, entitled to maintain this action upon both its causes.

Appellant makes some suggestion in its brief that, because the city has used the swamp for garbage and, in part, for sewage purposes for many years, the respondent cannot now interfere with its established practice. We think that the suggestion has two answers: (1) A city cannot by prescription or lapse of time acquire the right to maintain a nuisance. [Citations.] (2) The evidence shows that the city has, from time to time and recently, increased the amount of sewage and garbage which found its outlet into the waters of Flett Creek. Excess of pollution produced by the continuation of a nuisance is subject to injunctive process. * * *

DEATHS DURING WEEK ENDED NOV. 18, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Nov. 18, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	8,160	7,667
Deaths per 1,000 population, annual basis	11.4	11.0
Deaths under 1 year of age	594	622
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	52	51
Deaths per 1,000 population, annual basis, first 46 weeks of year	10.8	11.0
Data from industrial insurance companies:		
Policies in force	67,464,735	69,914,948
Number of death claims	13,283	13,548
Death claims per 1,000 policies in force, annual rate	10.3	10.1
Death claims per 1,000 policies, first 46 weeks of year, annual rate	9.7	9.5

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Nov. 25, 1933, and Nov. 26, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Nov. 25, 1933, and Nov. 26, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Nov. 25, 1933	Week ended Nov. 26, 1932	Week ended Nov. 25, 1933	Week ended Nov. 26, 1932	Week ended Nov. 25, 1933	Week ended Nov. 26, 1932	Week ended Nov. 25, 1933	Week ended Nov. 26, 1932
New England States:								
Maine	3	4	1	1	2	2	0	0
New Hampshire	2				75	1	0	0
Vermont	4	4			58	1	0	0
Massachusetts	28	43		2	387	68	2	2
Rhode Island		6	1				0	0
Connecticut	14	8	17	10	13	6	0	1
Middle Atlantic States:								
New York	47	65	[1] 17	[1] 9	370	345	5	4
New Jersey	24	21	23	14	30	89	0	0
Pennsylvania	73	108			231	216	4	4
East North Central States:								
Ohio	97	90	3	6	58	143	0	1
Indiana	108	85	34	48	28	7	1	2
Illinois	41	89	30	52	23	58	5	12
Michigan	34	20	2	3	19	230	2	3
Wisconsin	4	3	17	26	56	148	3	2
West North Central States:								
Minnesota	16	10			23	74	0	1
Iowa [1]	12	14			3		1	0
Missouri	90	46	8	2	42		3	2
North Dakota	10	5	1		8	115	0	0
South Dakota	1	11		1	202		1	0
Nebraska	7	22	8		17		0	0
Kansas	27	25		8	3	2	1	2
South Atlantic States:								
Delaware	1	3			2	2	0	0
Maryland [3]	22	12	11	15	2	3	1	1
District of Columbia	22	4		3	9		0	0
Virginia	124	69			24	61	0	1
West Virginia	80	62	52	55	16	97	1	1
North Carolina [3]	108	53	26	15	271	51	1	1
South Carolina [3]	24	17	393	469	56	4	0	0
Georgia [3]	69	49			243		2	0
Florida	14	39	2	2	1		0	0
East South Central States:								
Kentucky	96	107		89	4		1	1
Tennessee	68	84	63	169	220	4	1	4
Alabama [3]	102	42	37	1,940	14	3	1	2
Mississippi	28	24					1	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Nov. 25, 1933, and Nov. 26, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Nov. 25, 1933	Week ended Nov. 26, 1932	Week ended Nov. 25, 1933	Week ended Nov. 26, 1932	Week ended Nov. 25, 1933	Week ended Nov. 26, 1932	Week ended Nov. 25, 1933	Week ended Nov. 26, 1932
West South Central States:								
Arkansas	29	30	9	111	232	1	0	0
Louisiana [3]	49	32	9	600	9	1	1	1
Oklahoma [4]	89	53	25	47	50	6	1	0
Texas [3]	311	171	146	73	11	1	0	0
Mountain States:								
Montana			11	27	2	138	0	0
Idaho		6		28	2	4	1	0
Wyoming	1				31	1	0	1
Colorado	7	5	29			6	0	0
New Mexico	10	15	6	22	30		0	9
Arizona	3	7	27	479	6	1	0	0
Utah [2]		3	8	146	123	1	0	1
Pacific States:								
Washington		8	3	1	52		0	0
Oregon	1	3	25	112	9	40	1	0
California	39	71	63	1,721	126	41	3	3
Total	1,939	1,648	1,107	6,306	3,193	2,001	44	62

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Nov. 25, 1933	Week ended Nov. 26, 1932	Week ended Nov. 25, 1933	Week ended Nov. 26, 1932	Week ended Nov. 25, 1933	Week ended Nov. 26, 1932	Week ended Nov. 25, 1933	Week ended Nov. 26, 1932
New England States:								
Maine	4	0	9	13	0	0	3	4
New Hampshire	0	0	17	12	0	0	0	1
Vermont	1	0	6	7	0	0	0	0
Massachusetts	1	0	223	242	0	0	0	2
Rhode Island	0	0	12	25	0	0	1	0
Connecticut	0	0	71	64	0	0	1	1
Middle Atlantic States:								
New York	6	4	361	463	0	0	12	13
New Jersey	0	1	125	156	0	0	5	5
Pennsylvania	8	6	464	542	0	0	27	23
East North Central States:								
Ohio	2	2	472	641	1	2	7	12
Indiana	0	1	172	93	4	2	3	4
Illinois	1	3	426	354	0	1	18	11
Michigan	1	1	281	251	0	0	11	3
Wisconsin	3	0	97	68	24	1	3	14
West North Central States:								
Minnesota	2	0	83	77	1	0	2	2
Iowa	1	0	63	41	3	12	0	0
Missouri	0	0	200	72	3	0	4	4
North Dakota	0	0	52	22	0	14	0	0
South Dakota	0	0	2	8	0	1	0	2
Nebraska	1	1	28	31	11	2	0	0
Kansas	1	0	142	85	0	1	5	4
South Atlantic States:								
Delaware	0	0	6	3	0	0	1	0
Maryland [2]	1	2	93	71	0	0	14	4
District of Columbia	0	0	21	16	0	0	1	1
Virginia	1	3	170	84	0	0	9	21
West Virginia	3	0	141	82	3	0	2	15
North Carolina [3]	3	1	191	94	0	0	7	14
South Carolina [3]	1	1	22	14	0	1	11	5
Georgia [3]	5	1	17	22	0	0	9	10
Florida	0	0	7	4	0	0	0	0
East South Central States:								
Kentucky	3	4	113	128	0	0	11	34
Tennessee	0	3	139	59	7	7	17	20
Alabama [3]	2	1	55	46	0	0	20	8
Mississippi	1	0	23	30	2	1	2	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Nov. 25, 1933, and Nov. 26, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Nov. 25, 1933	Week ended Nov 26, 1932	Week ended Nov. 25, 1933	Week ended Nov. 26, 1932	Week ended Nov. 25, 1933	Week ended Nov. 26, 1932	Week ended Nov. 25, 1933	Week ended Nov. 26, 1932
West South Central States:								
Arkansas	2	0	27	50	0	0	5	5
Louisiana [3]	0	0	27	16	0	1	18	1
Oklahoma [4]	1	1	39	53	1	8	21	8
Texas [3]	3	0	100	117	15	1	28	8
Mountain States:								
Montana	2	0	17	13	0	0	2	2
Idaho	2	0	6	0	7	2	1	1
Wyoming	0	0	13	9	0	0	0	1
Colorado	0	0	28	27	1	1	3	7
New Mexico	1	0	25	4	0	0	13	1
Arizona	1	0	17	5	1	0	0	0
Utah [2]	0	0	8	12	0	0	1	0
Pacific States:								
Washington	2	5	44	24	3	6	13	8
Oregon	4	1	49	31	2	0	1	2
California	4	1	248	159	18	2	18	9
Total	74	43	4,952	4,440	107	66	330	291

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Nov. 25, 1933, 70 cases, as follows: North Carolina, 1; South Carolina, 1; Georgia, 31; Alabama, 13; Louisiana, 1; Texas, 23.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
Alabama	2	310	129	1,279	28	81	1	192	0	51
Georgia	2	251	199	778	141	26	3	99	0	63
Idaho		4	1		3		2	16	10	3
Illinois	16	184	49	54	57	3	37	1,063	1	101
Louisiana	3	174	24	649	6	15	1	67	1	81
New Hampshire		2					3	64	0	3
Oklahoma [1]	1	304	77	280	59	4	8	115	10	128
Oregon		3	80	1	54		8	131	12	17
Pennsylvania	15	305		4	287	3	70	1,357	0	206
Rhode Island		7	3	[2] 3	2		3	42	0	5
Virginia	1	513	271	74	8	15	9	564	0	98

[1] Exclusive of Oklahoma City and Tulsa. [2] Imported.

October 1933

	Cases
Anthrax:	
Pennsylvania	2
Chicken pox:	
Alabama	14
Georgia	10
Idaho	28
Illinois	483
Louisiana	2
Oklahoma [1]	11
Oregon	58
Pennsylvania	1,006
Rhode Island	14
Virginia	88
Dysentery:	
Georgia (amoebic)	5
Georgia (bacillary)	6
Illinois (amoebic)	30

October 1933—Contd.

	Cases
Dysentery—Continued.	
Illinois (bacillary)	22
Louisiana	8
Oklahoma [1]	22
Pennsylvania	5
Virginia	40
German measles:	
Illinois	21
Pennsylvania	14
Hookworm disease:	
Georgia	484
Louisiana	47
Impetigo contagiosa:	
Oklahoma [1]	7
Oregon	92
Lead poisoning:	
Illinois	2

October 1933—Contd.

	Cases
Lethargic encephalitis:	
Alabama	5
Georgia	3
Illinois	60
Oklahoma [1]	5
Oregon	1
Pennsylvania	21
Virginia	3
Milk sickness:	
Illinois	1
Mumps:	
Alabama	6
Georgia	8
Illinois	164
Louisiana	4
Oklahoma [1]	128
Oregon	8
Pennsylvania	403

[1] Exclusive of Oklahoma City and Tulsa.

October 1933—Contd

	Cases
Mumps—Continued.	
Rhode Island	1
Virginia	106
Ophthalmia neonatorum:	
Alabama	1
Georgia	1
Illinois	2
Oklahoma [1]	1
Pennsylvania	11
Virginia	1
Paratyphoid fever:	
Georgia	1
Illinois	2
Louisiana	1
Oregon	1
Virginia	3
Puerperal septicemia:	
Illinois	3
Oregon	1
Pennsylvania	15
Rabies in animals:	
Illinois	10
Louisiana	26
Oregon	1
Rabies in man:	
Alabama	1
Rocky Mountain spotted fever:	
Oregon	1

October 1933—Contd.

	Cases
Scabies:	
Oregon	66
Septic sore throat:	
Georgia	28
Illinois	17
Louisiana	2
Oklahoma [1]	17
Oregon	5
Rhode Island	3
Virginia	10
Tetanus:	
Alabama	7
Illinois	7
Louisiana	6
Pennsylvania	4
Virginia	7
Trachoma:	
Georgia	31
Illinois	3
Oklahoma [1]	14
Oregon	1
Virginia	1
Tularaemia:	
Georgia	1
Illinois	2
Pennsylvania	1
Virginia	4

October 1933—Contd.

	Cases
Typhus fever:	
Alabama	75
Georgia	76
Virginia	2
Undulant fever:	
Alabama	1
Georgia	3
Idaho	3
Illinois	8
Louisiana	2
Oklahoma [1]	2
Oregon	2
Pennsylvania	4
Rhode Island	4
Virginia	3
Vincent's infection:	
Illinois	57
Oklahoma	4
Oregon	4
Whooping cough:	
Alabama	52
Georgia	72
Illinois	509
Louisiana	10
Oklahoma [1]	15
Oregon	32
Pennsylvania	1,180
Rhode Island	128
Virginia	126

[1] Exclusive of Oklahoma City and and Tulsa.

WEEKLY REPORTS FROM CITIES

City reports for week ended Nov. 18, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Maine:											
Portland	0	1	0	2	3	1	0	0	0	0	34
New Hampshire:											
Concord	0	------	0	1	2	0	0	0	0	0	12
Manchester	0	------	0	4	1	0	0	0	0	0	11
Nashua	0	------	0	0	0	4	0	0	0	8	0
Vermont:											
Barre	------	------	------	------	------	------	------	------	------	------	------
Burlington	0	------	0	0	0	3	0	0	0	5	6
Massachusetts:											
Boston	5	------	1	66	23	32	0	9	1	63	218
Fall River	1	------	1	0	2	1	0	1	0	1	32
Springfield	0	------	0	2	1	1	0	3	0	23	31
Worcester	1	------	0	191	4	6	0	5	0	33	57
Rhode Island:											
Pawtucket	1	------	0	0	0	1	0	0	0	0	18
Providence	1	------	0	0	1	9	0	9	0	29	57
Connecticut:											
Bridgeport	0	------	1	1	0	1	0	1	0	6	23
Hartford	2	1	0	0	3	23	0	0	0	2	36
New Haven	2	------	0	0	4	1	0	0	1	5	25
New York:											
Buffalo	5	------	0	34	5	14	0	4	0	23	122
New York	21	15	14	16	169	79	0	81	6	100	1,531
Rochester	1	------	0	0	3	15	0	0	1	19	55
Syracuse	0	------	0	0	6	2	0	2	0	63	59
New Jersey:											
Camden	3	------	0	0	6	10	0	0	0	0	29
Newark	1	7	1	4	15	6	0	6	0	22	104
Trenton	0	2	1	0	3	4	0	0	1	3	36
Pennsylvania:											
Philadelphia	2	10	3	94	47	58	0	16	2	32	489
Pittsburgh	14	2	3	1	14	38	0	1	0	48	146
Reading	0	------	0	19	2	0	0	0	0	3	26
Ohio:											
Cincinnati	4	1	3	24	5	19	0	7	0	6	123
Cleveland	6	58	1	3	10	36	0	6	2	49	158
Columbus	4	------	0	1	6	33	0	2	0	2	101
Toledo	3	1	1	3	7	35	0	2	0	6	57

City reports for week ended Nov. 18, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
Indiana:											
Fort Wayne	4	------	0	0	4	4	0	0	0	0	29
Indianapolis	5	------	0	1	13	6	0	3	0	14	
South Bend	0	------	0	1	0	0	0	1	0	0	10
Terre Haute	13	------	0	2	1	1	0	2	0	1	17
Illinois:											
Chicago	0	9	4	7	50	131	0	42	0	78	702
Springfield	8	------	0	0	0	4	0	0	0	0	18
Michigan:											
Detroit	14	2	2	6	21	60	0	19	2	69	221
Flint	0	------	0	5	1	23	0	0	2	6	21
Grand Rapids	0	------	0	0	2	10	0	1	0	0	31
Wisconsin:											
Kenosha	0	------	0	0	0	7	0	0	0	5	5
Madison	0	------	------	0	------	2	0	------	0	29	19
Milwaukee	4	1	1	3	6	11	0	0	0	51	85
Racine	0	------	0	0	0	5	0	0	0	4	5
Superior	0	------	0	0	0	0	0	0	0	5	6
Minnesota:											
Duluth	0	------	1	0	3	2	0	0	0	3	27
Minneapolis	6	------	0	0	3	20	0	0	0	18	102
St. Paul	0	2	2	0	3	10	0	1	2	13	44
Iowa:											
Des Moines	3	------	------	0	------	17	0	------	0	0	32
Sioux City	2	------	------	1	------	2	0		0	1	------
Waterloo	0	------	------	0	------	0	0	------	0	5	------
Missouri:											
Kansas City	4	------	0	3	12	29	0	6	0	2	110
St. Joseph	2	------	0	1	5	2	0	2	0	0	20
St. Louis	21	1	------	16	8	27	0	10	2	22	193
North Dakota:											
Fargo	2	------	0	2	0	1	0	0	0	0	0
Grand Forks	0	------	------	0	------	0	0	------	0	0	0
South Dakota:											
Aberdeen	0	------	------	0	------	0	0	------	0	0	0
Sioux Falls	0	------	0	80	0	0	0	0	0	0	7
Nebraska:											
Omaha	1	------	0	6	3	12	5	2	0	8	10
Kansas:											
Topeka	0	------	0	0	0	7	0	0	0	3	3
Wichita	1	------	0	0	1	5	0	1	1	1	19
Delaware:											
Wilmington	1	------	0	0	3	1	0	2	0	1	32
Maryland:											
Baltimore	3	------	1	4	21	25	0	15	1	53	253
Cumberland	5	------	0	0	2	8	0	0	2	3	21
Frederick	0	------	0	0	0	3	0	0	0	0	4
District of Columbia:											
Washington	12	------	0	11	16	17	0	8	3	0	167
Virginia:											
Lynchburg	3	------	0	0	1	1	0	2	0	2	11
Norfolk	2	------	0	0	0	5	0	0	0	0	28
Richmond	10	------	0	0	2	11	0	1	0	0	57
Roanoke	6	------	0	0	0	12	0	0	0	0	13
West Virginia:											
Charleston	6	2	0	0	2	4	0	0	0	0	12
Huntington	6	------	------	0	------	16	2	------	0	0	------
Wheeling	0	------	0	1	3	7	0	1	1	0	21
North Carolina:											
Raleigh	2	------	0	1	1	9	0	0	0	3	1
Wilmington	0	------	0	0	1	2	0	0	0	0	13
Winston-Salem	16	1	1	66	2	9	0	1	0	0	18
South Carolina:											
Charleston	1	17	0	0	2	1	0	2	0	3	25
Columbia	0	------	0	0	0	0	0	2	0	0	13
Greenville	0	------	0	0	1	2	0	0	0	8	2
Georgia:											
Atlanta	21	10	4	0	7	6	0	5	0	2	88
Brunswick	0	------	0	1	1	0	0	0	0	0	7
Savannah	3	1	0	0	1	0	0	0	1	0	83
Florida:											
Miami	0	------	0	0	1	0	0	2	0	0	29
Tampa	3	------	0	0	0	0	0	1	0	0	23
Kentucky:											
Ashland	2	------	------	0	------	5	0	------	0	0	------
Lexington	2	------	0	0	2	1	0	1	0	1	12
Louisville	26	2	0	0	12	18	0	3	1	1	104

City reports for week ended Nov. 18, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Tennessee:											
Memphis	9	------	2	0	13	7	0	2	1	1	96
Nashville	5	------	0	0	3	11	0	1	2	17	------
Alabama:											
Birmingham	6	------	1	1	6	10	0	3	1	2	67
Mobile	1	------	1	0	2	0	0	1	0	0	21
Montgomery	2	------	------	0	------	2	0	------	0	1	------
Arkansas:											
Fort Smith	7	------	------	0	------	1	0	------	0	1	------
Little Rock	3	------	0	1	4	1	0	2	0	1	7
Louisiana:											
New Orleans	11	4	5	2	12	13	0	9	0	1	174
Shreveport	6	------	0	0	4	3	0	1	0	0	50
Texas:											
Dallas	35	------	0	0	10	7	3	1	1	0	68
Fort Worth	16	------	0	0	4	7	0	2	0	0	32
Galveston	1	------	0	0	3	1	0	2	0	0	18
Houston	27	------	0	0	6	5	0	3	0	0	69
San Antonio	8	------	2	0	5	4	0	6	2	0	63
Montana:											
Billings	0	------	0	0	0	0	0	0	0	0	7
Great Falls	0	------	0	0	2	0	0	0	1	7	8
Helena	0	------	0	0	0	0	0	0	0	0	1
Missoula	0	------	0	0	0	0	0	0	0	0	2
Idaho:											
Boise	0	------	0	0	0	2	0	0	0	0	6
Colorado:											
Denver	1	31	1	2	5	12	2	2	2	40	62
Pueblo	0	------	0	0	0	0	0	0	0	2	5
New Mexico:											
Albuquerque	1	------	0	0	0	3	0	2	0	1	6
Utah:											
Salt Lake City	0	------	0	40	3	6	0	0	1	8	30
Nevada:											
Reno	0	------	0	0	0	0	0	0	0	0	2
Washington:											
Seattle	0	------	------	1	------	12	0	2	3	32	73
Spokane	0	------	------	33	3	6	0	------	0	0	25
Tacoma	1	------	1	0	2	4	0	0	0	4	28
Oregon:											
Portland	0	------	0	1	7	16	3	0	0	2	73
Salem	0	1	0	1	0	0	0	0	0	0	0
California:											
Los Angeles	28	37	2	9	12	76	4	17	3	46	312
Sacramento	1	------	1	0	1	5	0	4	0	0	40
San Francisco	6	------	1	3	9	9	0	7	0	26	165

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Connecticut:			
New Haven	1	0	0
New York:			
New York	0	1	1
New Jersey:			
Newark	1	0	0
Pennsylvania:			
Philadelphia	3	2	0
Indiana:			
Indianapolis	2	0	0
Illinois:			
Chicago	6	1	1

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Michigan:			
Detroit	1	0	0
Maryland:			
Cumberland	0	0	1
West Virginia:			
Charleston	0	0	1
Huntington	0	0	1
Alabama:			
Birmingham	1	1	0
Texas:			
Dallas	0	0	1
California:			
Los Angeles	1	0	0

Lethargic encephalitis.—Cases: Boston, 1; Worcester, Mass., 1; New York, 5; Pittsburgh, Pa., 1; Detroit, 1; Grand Rapids, Mich., 1; St. Louis 4; Topeka, 1; Wheeling, W.Va., 1; Louisville, Ky., 1.

Pellagra.—Cases: New Orleans, 1; Dallas, Tex., 1.

Typhus fever.—Cases: Atlanta, 3; Savannah, 2. Deaths: Savannah, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—Two weeks ended November 4, 1933.—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the 2 weeks ended November 4, 1933, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis		1	1	1		1				4
Chicken pox		1		209	252	100	28	15	93	698
Diphtheria			6	86	20	29	1			142
Dysentery					1				2	3
Erysipelas				3	6	1		3	5	18
Influenza		15		1	6	1			13	36
Lethargic encephalitis					2					2
Measles		1		54	11	4			19	89
Mumps					59	6	19		33	117
Paratyphoid fever					3				2	5
Pneumonia					8		3		6	17
Poliomyelitis			1	8	3	1	1	4		18
Scarlet fever	1	18	25	200	151	44	8	8	104	559
Trachoma							3		22	25
Tuberculosis	2	4	11	77	114	2	5	3	33	251
Typhoid fever	1	4	3	77	33	5		1	2	126
Undulant fever					4					4
Whooping cough		25	5	103	141	44	16	1	21	356

Quebec Province—Communicable diseases—Two weeks ended November 18, 1933.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended November 18, 1933, as follows:

Disease	Cases	Disease	Cases
Chicken pox	326	Poliomyelitis	6
Diphtheria	57	Puerperal septicemia	1
Erysipelas	7	Scarlet fever	146
German measles	4	Tuberculosis	102
Influenza	4	Typhoid fever	49
Measles	265	Whooping cough	277
Ophthalmia neonatorum	3		

ITALY

Communicable diseases—Four weeks ended May 28, 1933.—During the 4 weeks ended May 28, 1933, cases of certain communicable diseases were reported in Italy as follows:

Disease	May 1-7		May 8-14		May 15-21		May 22-28	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	7	7	15	15	15	14	18	15
Cerebrospinal meningitis	11	10	14	12	5	5	7	6
Chicken pox	409	124	445	151	442	157	285	117
Diphtheria and croup	428	241	477	268	495	256	417	232
Dysentery	2	1	11	8	11	6	7	6
Lethargic encephalitis							3	3
Measles	1,604	275	1,800	290	1,915	315	1,605	269
Poliomyelitis	4	4	8	6	5	5	3	3
Scarlet fever	361	142	399	125	363	129	377	158
Smallpox					3	1		
Typhoid fever	162	100	253	157	273	165	235	140

MEXICO

Vera Cruz—Reportable diseases—April–June 1933.—During the 3 months, April, May, and June 1933, the following diseases have been reported in Vera Cruz, Mexico:

Disease	April 1933		May 1933		June 1933	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Anthrax		1	2			
Bronchitis		4		1		6
Cancer		4		5		8
Chicken pox	5				1	
Conjunctivitis (infectious)	1		1			
Diphtheria	3		2	1	2	
Dysentery	9	3	15	1	10	3
Erysipelas			1			1
Favus	4		2			
Gangrene		1				
Gastroenteritis		23		21		42
Hookworm disease		2		3		1
Influenza	1	1		1		
Jaundice		1				1
Malaria	80	4	130	11	130	7
Measles	7			4	5	5
Meningitis		2		3		
Peritonitis		1				1
Pernicious anemia				1		
Pleurisy		2				
Pneumonia		7		8		7
Poliomyelitis					1	1
Septicemia		1				
Septic sore throat					1	
Syphilis, hereditary		3		3		6
Tetanus		3		2		
Tuberculosis	22	19	28	15		10
Typhoid fever	7	1	5	1	12	3
Whooping cough					1	

VIRGIN ISLANDS

Notifiable diseases—August–October 1933.—During the months of August, September, and October 1933, cases of notifiable diseases were reported in the Virgin Islands, as follows:

Disease	Cases		
	August 1933	September 1933	October 1933
Chancroid		1	
Chicken pox		1	
Filariasis	1	2	34
Gonorrhea	2	3	2
Leprosy	1		1
Malaria	87	39	31
Paratyphoid fever		1	
Pellagra	1		
Syphilis	5	16	12
Tuberculosis	1	3	1
Typhoid fever			2
Uncinariasis	1	1	1

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Nov. 24, 1933, pp. 1431–1442. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Dec. 29, 1933, and thereafter, at least for the time being, in the ssue published on the last Friday of each month.)

Cholera

Philippine Islands.—During the week ended November 25, 1933, cholera was reported in the Philippine Islands as follows: Antique Province, Dao, 6 cases, 5 deaths. Bohol Province—Antequera, 5 cases, 4 deaths; Balilihan, 5 cases, 5 deaths; Clarin, 3 cases, 2 deaths; Mabini, 5 cases, 3 deaths; Tubigon, 50 cases, 27 deaths. Cebu Province—Argao, 4 cases, 3 deaths; Campostela, 1 case, 1 death; Carcar, 1 case, 1 death; Cebu City, 1 case; Liloan, 2 cases, 2 deaths; Minglanilla, 3 cases, 2 deaths; Naga, 7 cases, 1 death; Toledo, 4 cases, 3 deaths. Iloilo Province—Iloilo, 1 case, 1 death.

Plague

Manchuria.—According to latest information, dated October 23, 1933, there were 187 cases of plague in the vicinity of Tungliao, Manchuria, up to October 14, 1933, of which all but 2 or 3 percent were fatal.

In the Nungan District of Kirin Province there were 436 deaths from bubonic plague up to October 11, 1933. In Fuju near Nungan there were 2 deaths up to October 3, and in Changling 17 cases, of which 14 were fatal.

In the Taonan area up to October 12, 1933, 15 deaths from plague occurred at Hunghsing, 23 deaths at Chanyu, and 1 case at Taonan. At Kaolipan, 50 miles southwest of Taonan, there had been about 200 cases of plague.

Yellow Fever

Nigeria—Kano.—On November 4, 1933, 1 case of yellow fever occurred at Kano, Nigeria.

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An Abstract of the Annual Report of a Marine Hospital
Deaths in Large Cities During Week Ended November 25
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

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They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of public health.

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THE ESTIMATION OF TISSUE PHENOLS

The Distribution of Phenol in the Tissues of the Normal and of the Poisoned Rabbit

By MAURICE I. SMITH, *Principal Pharmacologist, National Institute of Health, United States Public Health Service*

The problems of phenol metabolism and the fate of phenolic compounds in the animal body are intimately connected with the accurate estimation of phenol in the body tissues and fluids. The early investigations in this field, though contributing knowledge of a fundamental character, made progress slowly for lack of quick and reliable methods for the estimation of phenols in body tissues and fluids. Many investigators studied the problem of urinary phenols following Baumann's isolation of phenol sulphuric acid in 1876 (1). The older methods (2, 3), being time consuming, lacking in accuracy and requiring much material, made little headway until Folin and Denis, in 1912 (4), described their phosphotungstic-phosphomolybdic reagent for phenols, and in 1915 (5) described a colorimetric method for the determination of phenols in urine. Their method has received considerable criticism, the chief of which is that their reagent is not specific for phenols, but that it reacts also with many other substances, such as uric acid, tryptophane, tyrosine, indole and derivatives, and lactic acid (6). Nevertheless, with certain limitations their method has been found exceedingly useful in the determination of phenols in feces (7) as well as in urine, and their method has also been applied with some modifications to blood (8, 9, 10, 11).

In order to meet the criticism of nonspecificity of the phosphotungstic-phosphomolybdic reagent for phenols, Theis and Benedict (11) applied a diazotized p-nitroaniline reagent to protein-free blood filtrates. In this procedure they consider it unnecessary to remove uric acid first. In a series of analyses upon human blood they reported 1 to 2 mg free phenols per 100 cc. Added phenol was recovered from blood by this method to the extent of from 90 to 112 percent. In a previous investigation in which the phosphotungstic-phosphomolybdic reagent had been used, these authors reported an average of 4.70, with variations of from 1.87 to 7.96 mg phenol per 100 cc of human blood (8).

Rakestraw (10), using the Folin and Denis reagent and removing uric acid by means of $ZnCl_2$ and Na_2CO_3, probably the best procedure

yet devised, reported from 1.86 to 5.37 mg free phenol per 100 cc of human and dog's blood. In a series of 19 experiments on rabbits with this method we have recently obtained similar results. An average of 5.47, with variations of from 4.17 to 6.81 mg percent, was found for total blood phenols, and an average of 2.56 with the extremes of 1.79 to 3.84 mg percent was recorded for free phenols (12). Pelkan and Whipple (9), using a somewhat similar method, reported 2.74 to 4.28 mg total phenols per 100 cc of dog's blood.

While these methods may yield important information in certain types of carefully controlled experiments, it is certain that such values for blood phenols as have been reported in the literature are in no sense an index of the true phenols occurring normally in blood, either free or in such combination as may be split off by acid hydrolysis.

Since the phenols as measured by the methods referred to above include, with the possible exception of uric acid, which is more or less completely removed, all nonprotein constituents of the blood which may react with phenol reagents, it is evident that such methods are not suitable in investigations dealing with the fate of phenols and phenol compounds in the body, including their distribution, detoxification, conjugation, etc.

Haas and Schlesinger (13), recognizing this fundamental difficulty, undertook to determine blood phenols in dogs by distilling whole blood previously boiled with Na_2SO_4 and CH_3COOH and then estimating the phenol in the distillate with Millon's reagent. Their method requires 20 to 30 cc of blood, which is a serious drawback when working with small animals. Moreover, failing to deproteinize the blood prior to distillation, their method is not at all applicable to tissue phenols.

The problem of tissue phenols is even more difficult. With the exception of the recent work by Marenzi (14), there seems to have been no systematic study made of the quantitative distribution of phenols in the tissues. Marenzi applied the diazotized p-nitroaniline reagent of Theis and Benedict (11) to trichloracetic acid filtrates of various tissues of the rat and obtained average total phenol values ranging from 12.4 mg per 100 g of heart muscle to 21.2 mg per 100 g of spleen. Rat blood is reported to contain by this method 1.8 mg total phenols per 100 cc. The free phenols were reported to range from 11.0 mg per 100 g of heart to 18.0 mg per 100 g of spleen.

In our studies on the pharmacology of phenol esters we have been greatly interested in the problem of tissue phenols, and more particularly the phenols of the central nervous system. In a group of three experiments designed to determine the total phenols of the brain and spinal cord of the normal rabbit after the manner of Marenzi,

using the Folin and Denis reagent after the preliminary removal of uric acid by means of $ZnCl_2$ and $Na_2 CO_3$, values were obtained ranging from 5.16 to 7.03 mg per 100 g of brain and from 4.0 to 5.99 mg percent of spinal cord. Values of the same order of magnitude were also obtained with the reagent of Theis and Benedict. These values, which are in keeping with the similarly high values reported by Marenzi for other tissues, obviously do not represent true phenols, and the criticism directed against the methods of blood-phenol estimation holds with equal, if not greater, force against the method of tissue phenol estimation as proposed by Marenzi.

The present work concerns itself exclusively with such volatile substances reacting with phenol reagents as may be recovered by distillation of protein-free filtrates of blood and tissues, either directly or subsequent to hydrolysis with mineral acids. The phenol reagents are the phosphotungstic-phosphomolybdic reagent of Folin and Denis (4) or the diazotized p-nitroaniline reagent of Theis and Benedict (11). The former is preferred, even though it is the less specific of the two, because it is colorless in blank solution while the Theis and Benedict reagent is yellow, and the error in estimating small quantities of phenol may be very considerable. Moreover, the greatest source of error in the prevailing methods of estimating phenols in biological material is not so much in the relative difference in specificity of the two reagents as it is in the variable and large amount of nonphenolic and phenol-like bodies that react with both reagents, and are measured along with the true phenols. In problems dealing with the fate and the mechanism of action of phenols and phenol compounds the primary consideration is the accurate quantitative estimation of phenols, in the strict sense of the term, which may occur in the blood and tissues free or in such combination as can be broken down by acid hydrolysis. It may be admitted that even the phenol-reacting volatile substances obtained by distillation of protein-free tissue extracts may not all be true phenols; nevertheless, the nonspecific substances, if any, are reduced in this procedure to a negligible minimum.

THE METHOD

The tissue is weighed accurately to the nearest centigram and is thoroughly pulped with pure sand in a glass mortar. Five to 10 grams of tissue will usually suffice. The material is then extracted with 5 volumes of 10 percent aqueous solution of trichloracetic acid and filtered. In computing the volume of the trichloracetic acid solution, the usual allowance should be made for the approximate 80 percent water content of the tissue. In the case of blood, a definite volume is simply stirred into 4 volumes of the trichloracetic acid solution and filtered. An aliquot of the filtrate, varying in amount

from 1.0 cc to 25 cc, i.e., the equivalent of from 0.2 to 5 g of tissue according to the phenol content, is then measured into a small distilling flask of 100–150-cc capacity, diluted to about 30 cc with water and distilled directly into a 50-cc or, if the phenol content is very low, a 25-cc volumetric flask. The distillation flask is provided with a long-stem, small separatory funnel so that distilled water may be added in the course of the distillation if desired. A few glass beads in the distillation flask will ensure uniform boiling.

Experiments with small quantities of phenol or orthocresol in amounts of from 0.1 to 0.3 mg added to about 25 cc of 10 percent trichloracetic acid solution or to trichloracetic protein-free tissue filtrates have shown that recovery of the phenols is usually quantitatively complete if the distillation is carried to about two thirds or three fourths of the total volume. To ensure complete recovery of the phenols, it is best that there be not much over 0.3 mg in about 30 cc; approximately two thirds of this should be distilled over, about 15 cc of distilled water should then be added and the distillation continued until another two thirds of the volume has distilled over.

The phenol is estimated in the combined distillates by adding 1 to 3 cc of the Folin and Denis phenol reagent,[1] 8 cc 20 percent Na_2CO_3 solution, and water to volume (4 cc Na_2CO_3 solution if the final volume is 25 cc). After 20 to 30 minutes the reading is made in the colorimeter in the usual manner, using phenol or preferably resorcin as a standard. The minimum amount of phenol that can be estimated quantitatively with some degree of accuracy is about 0.01 mg when matched against a standard of 0.03 mg phenol in 50 cc. Quantities of 0.05 to 0.4 mg phenol can be estimated with a degree of accuracy of about ± 5 to ± 10 percent if matched against appropriate standards.

In the case of estimating orthocresol in tissues of animals poisoned with this compound, the same general procedure is used, except that the final solution, after the reagent and alkali have been added, must be heated at 50–55° C. for about 20 minutes in order to bring out the maximum intensity of the blue color. The relative colorimetric values of phenol and the three cresols in relation to resorcin have been given in a previous publication (15).

The above procedure satisfactorily estimates free phenols in the blood or any of the tissues. Conjugated phenols appear to be sufficiently stable to withstand boiling in trichloracetic acid solution. This was determined in experiments on trichloracetic filtrates of tissues from animals poisoned with phenol in such a manner as to give rise to both free and conjugated phenols. The phenol values in such tissue extracts were found the same whether the trichloracetic filtrate was distilled directly or after the excess acid had been neutralized with NaOH to pH 5.0–6.0 (methyl red indicator).

[1] [illegible]imately 1 cc reagent for each 0.1 mg phenol.

Total phenol is estimated in the same manner after the conjugated phenols have been hydrolyzed. Numerous experiments were made to ascertain the optimum conditions. An adequate concentration of hydrochloric acid is essential to effect complete hydrolysis and liberation of combined phenol. Excess acid must, however, be avoided, especially when working with concentrated tissue extracts, particularly liver, intestine, or kidney, with low phenol content. Prolonged hydrolysis of such tissue extracts with strong hydrochloric acid may yield too high values, probably due to liberation of volatile nonphenolic substances capable of reacting with the phenol reagent. Thus in one instance distillation of 25 cc of 1:5 trichloracetic acid extract of normal rabbit liver with 4.0 cc concentrated hydrochloric acid yielded in the distillate a phenol equivalent of 3.63 mg per 100 g This could hardly be true phenol.

Experience has shown that, for tissues of animals poisoned with phenol, containing in the neighborhood of 10 to as much as 200 mg conjugated phenols per 100 g, 2 cc concentrated hydrochloric acid added to 2 cc or less of the 1:5 trichloracetic filtrate diluted with water to about 25 cc is sufficient to hydrolyze completely the combined phenols in the course of distillation. If less acid is used, preliminary hydrolysis for about an hour on the boiling water bath may be required to ensure complete liberation of the combined phenols.

The difference between the total phenols so determined and the free phenols represents the conjugated phenols.

BLOOD AND TISSUE PHENOLS IN THE NORMAL RABBIT

Using the method as described above, a series of experiments was made to determine the extent of occurrence of volatile phenols or phenol-like substances in the blood and tissues of the normal rabbit. The following typical protocols will illustrate the results:

Experiment 35.—Rabbit, 2.5 kilos. Exsanguinated under ether anesthesia. Some of the blood was oxalated. Trichloracetic acid filtrates were prepared as described, and suitable aliquots, usually the equivalent of 3 to 4 g of tissue, were distilled. The phenol values obtained, reckoned in mg per 100 g of tissue, were as follows:

Blood	0.26
Brain	.89
Spinal cord	.65
Liver	.65
Spleen	1.39
Bone marrow	.34

It is evident that none of the tissues examined contain more than mere traces of what might be considered phenols. The relatively high value for spleen is probably due to experimental error involved in estimating minute quantities of phenols in a limited amount of tissue.

Experiment 34.—Rabbit, 2.5 kilos. Treated as in the preceding experiment. Aliquots of the trichloracetic acid filtrates representing the equivalents of from 3 to 5 g of tissue were treated with 0.5 cc concentrated HCl and distilled. The following phenol values, in mg per 100 g of tissue, were obtained:

Blood	0.50
Brain	.66
Spinal cord	.55
Skeletal muscle	.47
Liver	.61
Small intestine *	.75
Large intestine *	.71
Kidney	.54
Lung	.50

Experiment 29.—Rabbit, 2.8 kilos. Distilled 4.0 g equivalents of trichloracetic acid filtrates after adding 0.5 to 1.0 cc of 10 N H_2SO_4. Phenol estimation in the distillates showed the following, in mg percent:

Blood	0.37
Small intestine*	.34
Kidney	.30
Liver	.59

While the degree of acidity and time of hydrolysis may not have been entirely adequate, the last two experiments nevertheless give no evidence of any considerable amount of combined phenols in the blood or tissues of the normal rabbit.

TABLE 1.—*Recovery of phenols added to normal rabbit tissues*

Experiment	Tissue	Phenol added	Amount recovered	
			Mg per 100 g	Percent
		Mg per 100 g		
1	Intestine	Phenol—2	2.28	114
2	Blood	do	1.86	93
3	Brain	o-cresol—2	1.64	82
4	Blood	o-cresol—5	4.47	89
5	do	o-cresol—10	9.23	92
6	Kidney	Phenol—5	5.00	100
7	Liver	o-cresol—5	5.04	101
Average				96

Experiments made to ascertain to what extent added phenol or orthocresol can be recovered from normal tissues by this method are shown in table 1. Phenol or orthocresol added to such tissues as blood, brain, liver, kidney, and intestine, in the small amounts of from 2 to 10 mg per 100 g were recovered on an average of 96 percent of the amounts added. It may be concluded, therefore, that the tissues of the normal rabbit contain a mere trace of what might be regarded as true phenols, indeed not much over 0.5 mg percent; and that as little as 2.0 mg phenol percent added to normal tissues can be recovered practically quantitatively.

* Exclusive of contents.

THE DISTRIBUTION OF PHENOLS IN THE TISSUES OF THE POISONED RABBIT

In this series of experiments, phenol or orthocresol was administered in varying doses to rabbits and certain of the tissues were analyzed for free and total phenols by the present method. The chief findings in these experiments may be illustrated by a few protocols.

Experiment 36.—Rabbit, 2.6 kilos.

At 1:20 p.m. administered by stomach tube 0.7 g per kilo orthocresol in 50 cc water partially emulsified with the aid of 5 cc alcohol.

At 1:23 coarse generalized tremors, followed by general muscular weakness, coma and death within 1 hour. Immediately after death the orthocresol content of the various tissues was estimated with the following results, expressed in mg per 100 g of tissue:

	Free	Total
Blood	16.30	16.07
Brain	19.90	18.75
Spinal cord	19.21	----------
Liver	24.45	27.77
Kidney	25.86	40.68
Lung	15.73	19.90
Bone marrow	25.96	22.50
Skeletal muscle	6.94	7.21

It appears from the above that in acute fatal poisoning, orthocresol is widely distributed throughout the tissues of the body. Conjugation under these conditions is not in evidence, with the possible exception of the kidney.

In the next experiment the phenol distribution in the more prolonged, subacute type of poisoning is shown.

Experiment 37.—Rabbit, 2.7 kilos.

From 9:45 a.m. to 2 p.m. injected intramuscularly o-cresol in olive oil, in several repeated doses, until a total of about 1.5 cc per kilo had been received. Severe symptoms of poisoning were observed throughout. The animal was finally killed with chloroform, and the tissues were prepared as usual for orthocresol determination. The following results were obtained, expressed in terms of mg orthocresol per 100 g tissue:

	Free	Total		Free	Total
Blood	26.41	97.03	Bile	7.50	----------
Brain	20.96	----------	Kidney	72.31	254.00
Spinal cord	22.33	----------	Small intestine*	16.07	----------
Liver	15.79	44.31	Large intestine *	23.49	49.54

* Exclusive of contents.

From this experiment it appears that in slow phenol poisoning conjugated phenols may be found in many tissues. The kidney appears to be by far the most important organ for detoxification, if its high concentration in combined phenols may be taken as evidence

of phenol conjugation therein. It is, of course, possible that the high phenols found in the kidney may be accounted for by the excretory function of this organ. Obviously, more work will be needed to clarify this point. From the evidence that has been available heretofore it has generally been held that the liver is the main, if not the exclusive, site of phenol conjugation.

Embden and Glaessner (16) reviewed the contradictory experiments of the older literature and adduced evidence of their own, on the basis of perfusion experiments, that the liver is of foremost importance in the conjugation of phenol sulphuric acid. They ascribed this function also to a slight extent to the lungs and kidneys. More recently Pelkan and Whipple (17) concluded that, in the dog, phenol conjugation occurs in the liver exclusively. Their evidence is indirect and based on experimental data derived from inadequate methods of blood phenol analysis.

In the following experiment an attempt was made to ascertain the relation of tissue phenol concentration to symptoms of phenol poisoning. A toxic dose, approximately 50 percent of the minimum lethal dose of phenol, was injected; and as soon as symptoms of poisoning appeared, the animal was killed and tissue phenols were determined. The details and results follow.

Experiment 43.—Rabbit, 2.2 kilos.

At 11:10 injected subcutaneously 250 mg per kilo, 5 percent aqueous phenol solution.

At 11:20, moderately severe coarse tremors, some muscular weakness, and general hyperirritability. Killed by intravenous injection of 2 cc chloroform. Blood and tissue phenols were as follows, in terms of mg per 100 g:

	Free	Total	Conjugated, percent of total
Blood	8.10	8.93	9.3
Brain	8.93	8.92	0.0
Spinal cord	6.38	6.67	4.3
Liver	3.33	6.98	52.3
Kidney	7.14	11.54	38.1

This experiment shows again the rapid and wide distribution of phenol in the body tissues. The highest concentration of free phenol was found in the brain. There is no evidence of phenol conjugation in the brain or spinal cord, but decided evidence of its conjugation in the liver and kidney. The very slight and almost insignificant increase of the total phenols over the free fraction in the blood makes it likely that the 4.40 mg of conjugated phenol per 100 g of tissue found in the kidney had combined there.

The question of distribution of conjugated phenol was studied in somewhat greater detail in the following experiment:

Experiment 44.—Rabbit, 2.4 kilos.

At 11:10 a.m. to 2:50 p.m. injected subcutaneously 4 doses of a 5-percent aqueous solution of phenol, 150 mg per kilo each. There were slight to moderately severe symptoms of phenol poisoning throughout.

At 3:15 p.m. killed with chloroform. Anaylsis of the tissues for phenols showed the following:

	Free	Total	Conjugated, percent of total	Ratio of Conjugated to free
Blood	11.71	32.61	64.1	1.78
Brain	6.98	7.21	3.1	.03
Spinal cord	6.52	8.20	20.5	.25
Liver	4.68	21.63	78.3	3.62
Kidney	17.85	99.96	82.2	4.60
Small intestine *	7.85	21.63	63.7	1.75
Skeletal muscle	4.71	10.13	53.5	1.15

* Exclusive of contents.

This experiment demonstrates that, with the exception of the brain and spinal cord, all the tissues examined, including striated muscle, contained very appreciable amounts of bound phenols.

In view of the high ratios of conjugated to free phenol in the kidney, liver, small intestine, and striated muscle, in comparison with that of blood, it is scarcely possible to ascribe the conjugated phenols in these tissues to their blood content. That might possibly be the case with the relatively slight amount of bound phenol found in the nervous system. These findings certainly lend support to the view that the function of phenol conjugation is not limited to any one tissue or organ, and that, with the possible exception of the central nervous system, many tissues in the body appear to be capable of detoxifying phenols by conjugation.

SUMMARY AND CONCLUSIONS

A method has been described for the quantitative estimation of true phenols, free and conjugated, applicable to all body tissues and fluids.

The tissues of the normal rabbit (oat and cabbage diet) were found to contain less than 1.0 mg percent and usually not much over 0.5 mg percent of what might be regarded as true phenols.

In phenol or orthocresol poisoning, phenols were found in appreciable amounts in all the tissues examined. In acute lethal poisoning, free phenol was found in concentrations ranging from about 7 to 26 mg per 100 g of tissue, the lowest value having been found in skeletal muscle and the highest in the kidney. Conjugated phenols were not found in appreciable amount anywhere. In subacute poisoning, conjugated phenols were found in all the tissues examined with the exception of the central nervous system, which showed little or no combined phenols.

These findings suggest that the function of phenol conjugation is not limited to any one tissue, although it seems to occur predominantly in the kidney, liver, and intestine, while the brain and probably also the spinal cord appear to be devoid of this function.

As much as 6 to 8 mg free phenol per 100 g were found in the central nervous system of the rabbit following the administration of a toxic but nonfatal dose of phenol.

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ABSTRACT OF ANNUAL REPORT OF THE U.S. MARINE HOSPITAL, BALTIMORE, MD., FISCAL YEAR 1933 [1]

(Medical Director R. H. Creel in charge)

Professional services at the marine hospital in Baltimore, Md., during the fiscal year 1933 were much the same as in previous years. The hospital continued to operate with maximum bed capacity. Whereas the normal number of beds was rated as 167, the average number of patients exceeded 193, and at times was in excess of 200. This excess over normal capacity was cared for by beds on porches and the utilization of temporary buildings. There have been very few complaints and many expressions of appreciation and commendation of ward personnel by patients.

During the year there were admitted 1,580 patients for a total of 70,464 days' treatment, and 6,798 out-patients were given an aggre-

[1] This summarized report of the Baltimore Marine Hospital is presented as more or less representative of the work of the other marine hospitals of the Public Health Service that are not devoted to the care of special patients.

gate of 49,063 treatments. Of the total number admitted, 1,037, or 66 percent, were merchant seamen, 182, or 12 percent, Coast Guardsmen, and 99, or 6 percent, beneficiaries of the Employees' Compensation Commission. The total number of in-patients during the year was 1,775. Of these the surgical service handled 765, or 43 percent; 602, or 34 percent, were cared for on medical service, of which number 82, or 5 percent, were in tuberculosis section; and 408, or 23 percent, were on venereal-disease service. Of the 38 deaths, 15 resulted from surgical conditions (partly operative), and 23 from medical conditions. Six of the surgical group died from cancer.

One hundred and five in-patient and 338 out-patient beneficiaries of the Employees' Compensation Commission were examined and treated, and in addition 671 Employees' Compensation Commission beneficiaries, 53 longshoremen, and 195 veterans were examined for purpose of report. These reports require considerable administrative attention, are time-consuming, and add very materially to the duties of the clerical force. The examination of compensation cases, in general, with the estimate of degree of disability, is difficult and perplexing. The determination of disability is simple in a certain number of cases in which the physical impairment is obvious; but a very substantial number of this group present no physical evidence of disability, and base their claim for such on complaints of subjective symptoms, such as pain or tenderness. Certainly, in a substantial number the symptoms are exaggerated for purpose of hospitalization or compensation. Not infrequently the physical impairment caused directly by accident is aggravated by focal infections or coincident ailments, and these factors add to the difficulty and confusion in estimating disability as directly due to the injury. One hundred and seventy beneficiaries of the Veterans' Administration were hospitalized for a total of 4,292 days, with reimbursement of $15,022. Incident to the enactment of new legislation, the latter part of the fiscal year, the hospitalization of this group was discontinued.

There was some addition to the equipment during the year. An electro-surgical unit for cauterizations and desiccations was purchased for the surgical department, and this contributed very much to the efficiency of operations for malignancies and brain work, and the so-called bloodless surgery wherever indicated.

SURGICAL SERVICE

The surgical service has a capacity of 85 beds, 12 of which are for colored patients. This number of beds proved to be inadequate, and transfers to other services and the discharge of patients before complete convalescence were necessary at times in order to provide available beds. Of the 1,580 patients admitted to the hospital, 681

were admitted to surgical service direct and 72 by transfer from other wards, and, in addition, 401 out-patient beneficiaries received surgical treatment, making a total of 1,154 patients treated on surgical service during the year. There were 1,251 operations performed in the general surgical section. These were exclusive of surgical procedures in the G-U section, dental clinic, eye, ear, nose, and throat clinic, and out-patient departments; likewise they do not include injections of arsenicals or minor operations in the medical section, such as spinal punctures, phlebotomy, pleurocentesis, pneumothorax, and similar procedures. The major operations included, among others, 101 appendectomies, 30 amputations, 137 hernia repairs, and 45 treatments of fractures. The employment of various anesthetics continued about the same as in former years, the majority of patients receiving spinal anesthesia or avertin. There were 490 cases which received general anesthesia, of which 61 percent received spinal, 12 percent avertin, and 26 percent gas and ether. Ether alone was given to 6 patients only during the year; 21 received gas and oxygen alone; 251 were given spinal anesthesia (spinocain), and 49 received rectal anesthesia (avertin) supplemented, however, in the majority of cases by gas or ether. Sixty patients received a combination of gas and ether. Other operations were performed under local anesthesia, generally produced by procaine. Nupercaine was the anesthetic generally used for cystoscopies. In operations below the umbilicus, spinal anesthesia continued to be the choice. Avertin was found to be a very satisfactory basal anesthetic, but in prolonged operations it not infrequently has to be supplemented by ether or gas. Avertin continued to be used in dental cases, with most satisfactory results, and this was particularly the case where a considerable number of teeth were to be extracted. Spinal anesthesia was administered to 253 patients without any untoward results or complications.

MEDICAL SERVICE

The medical service includes some 75 beds, 13 of which are for colored patients. This number of beds is inadequate for the service, and it is frequently necessary to discharge patients early in their convalescence in order to accommodate patients in greater need of hospitalization. Fourteen beds are allocated to tuberculous patients. Of the total number of 1,580 patients admitted to the hospital, 544 were admitted direct to medical wards and 43 subsequently transferred from other wards. Of this total, 67 were tuberculous and 8 were suffering from some psychosis. Treatments to medical out-patients totaled 199. The electro-cardiograph was used frequently as a diagnostic aid; 96 examinations of this nature were made during the year. Basal metabolism tests were made with more or less frequency, averaging throughout the year about 10 per month. The oxygen tent was used

with satisfactory results on some pneumonia patients, and the mortality rate was very low for the hospital practice as compared with general statistics. The case fatality rate for lobar pneumonia on medical service was 18 percent.

GENITO-URINARY SERVICE

In the G-U service some 424 patients were treated, practically all for venereal infection. There were 2,053 neoarsphenamine injections given to in-patients and 1,573 to out-patients. Bismuth and mercury injections were given in-patients 2,126 times, and to out-patients 1,842 times. There were occasional moderate reactions in the nature of dermatitis but none of serious consequence. Examination of spinal fluid in all cases of syphilis, both early and late, was continued as routine for white patients. The apprehension of the colored patients was such, and their opposition to spinal puncture so marked, that it could not be routinely resorted to among those patients. The routine adopted was that of spinal puncture after the third injection of neoarsphenamine. Those then showing spinal-fluid changes indicative of central-nervous-system lues were treated by malaria inoculation. A few of this group were also treated by mechanical hyperthermia. This form of therapy, however, was mainly utilized in the treatment of gonorrheal urethritis and gonorrheal arthritis. Of the 35 cases of central-nervous-system syphilis treated with the tertian type of malaria, 33 showed very marked improvement, and of the 48 cases treated by quartan-type malaria, 40 showed very marked improvement. The strain of malaria was maintained practically throughout the year by transfer from patient to patient. Malaria blood was furnished to the Johns Hopkins Hospital, University Hospital, Veterans' Administration Hospital at Perry Point, Md., and the Maryland State Hospital—in all, on 45 occasions. Spinal punctures were made 218 times.

EYE, EAR, NOSE, AND THROAT CLINIC

During the year there were given in the eye, ear, nose, and throat clinic 4,330 treatments to in-patients and 2,025 to out-patients. Fifty-five operations were performed, mainly of a minor character, as submucous resections and tonsillectomies. The more important operations on the eye were performed in the general surgical section, either by a member of the resident staff or a consultant or attending specialist.

DENTAL SERVICE

In this department there were administered 23,998 treatments to a total of 6,250 patients. This included both in-patients and out-patients. The dental service likewise took all X-ray pictures of teeth;

the number of exposures was 3,031. Operations of this department involved 139 alveolectomies, 260 full dentures, 2,956 extractions, 2,057 fillings, and the treatment of 3 fractured mandibles. The work of the dental service was carried on partly at the hospital and partly at the out-patient office in the customhouse, where two dental chairs were installed and a dental officer and oral hygienist were on duty.

CLINICAL LABORATORY

The clinical laboratory of the station is fairly well equipped, although in somewhat cramped quarters. A very substantial amount of work was carried out, however, including blood chemistry, quantitative and qualitative urinalysis, sputum examinations, typing of blood, gastric analyses, kidney and liver function tests, stool examinations, animal-inoculation tests, serological tests of spinal fluid, and miscellaneous bacteriological procedures. In accordance with more or less established procedure at this station, the genito-urinary department at the hospital and the out-patient office perform most of the examinations of urethral smears of patients under their respective charge. The routine examination of the blood of all patients admitted to the hospital, by the Kahn test for syphilis, was continued. This test was also made on out-patients whose symptoms were suggestive of syphilis. The laboratory work comprises an elaborate list of tests, but it may be noted that the laboratory made 4,602 red and white cell counts, 2,125 blood smears, approximately 600 blood-chemistry tests, 4,679 Kahn tests for syphilis, 4,693 urinalyses, 562 gastric analyses, almost 300 examinations of spinal fluid, 586 sputum examinations, and numerous other laboratory tests.

X-RAY DEPARTMENT

The work in the X-ray department showed a substantial increase over the preceding year; 7,374 exposures were made of the chest, bones and joints, gastro-intestinal and urogenital tracts, and skull and sinuses; 896 fluoroscopic examinations were made; and 436 X-ray treatments were given. The X-ray technician operates the electro-cardiograph, and took and developed electro-cardiographic films in 96 cases. Many clinical photographs were also taken. The X-ray department was a very substantial aid in the diagnostic field. Several unusual, more or less obscure, conditions were detected, involving in one instance a congenital single kidney, and in another a gastro-jejuno-colic fistula. During the latter part of the year the fluoroscope was employed more, mainly for economy in films.

PHYSICAL-THERAPY DEPARTMENT

The physical-therapy department functioned as in previous years, in cramped quarters and with consequent limitation of equipment. Helio-therapy, electro-therapy, massage and passive motion are used. Floor space is lacking for hydro-therapy. There were 12,574 treatments given to in-patients and 4,059 to out-patients.

OUT-PATIENT DEPARTMENT

The out-patient office, located in the customhouse in the downtown section of Baltimore, performs a very wide range of functions, including relief and physical examinations of the following classes: Candidates for license as mates, pilots, engineers; civil employees for retirement; civil-service appointees; beneficiaries of the United States Employees' Compensation Commission; seamen, and various others. The office likewise gives instructions in first aid and sanitation to ships' officers and applicants for ships' officers' papers. It attends to the issuance of permits for medicinal liquor and narcotics aboard ships. It issues port sanitary statements, and discharges various other miscellaneous functions. Adequate floor space has been provided by the collector of customs, well arranged and fully equipped. The office includes a very ample clinical laboratory, physical-therapy department, dental clinic, and other rooms for clinical work.

POST MORTEMS

Effort has been made to perform post mortems on every patient dying in the hospital, but consent of relatives cannot always be obtained. There were 38 deaths, of which number 14, or 36 percent, were examined post mortem by a member of the staff, attended by such other members as the work of the hospital would permit. Tissue examinations, both post mortem and ante mortem, are made at the National Institute of Health.

NURSING SERVICE

Twenty-five nurses, including the chief nurse, were accredited to the station. Excluding nurses employed solely in the operating room and in the various clinics and the out-patient office, and three on night duty, there remained 18 for nursing in the wards. Considering the absentees on annual leave or sick leave, there were available for day duty, on the average, 13 nurses. Nursing work, however, has been conducted in a very commendable manner. Wards are maintained in a clean, orderly condition, and the service rendered to patients has been very satisfactory.

A member of the clerical force devotes a limited amount of time performing commissions and aiding bed-ridden and helpless patients. Religious services and entertainments were not possible, as facilities remained limited. However, a Red Cross representative visited the hospital weekly and distributed small necessities to the patients. Of the 38 deaths during the year, 11 bodies were buried by the Public Health Service. The welfare clerk attended these funerals to see that they were carried out in a proper manner. Throughout the year, and especially during the winter months, numerous applicants for hospitalization were found ineligible, and arrangements were made through various city welfare agencies to care for them. Likewise, arrangements were made for some 23 convalescent patients, whom it was necessary to discharge although not yet able to return to duty, all of whom were without funds and were given board and lodging at the Anchorage (Y.M.C.A.).

The new hospital building is expected to be ready for occupancy about November 1, 1933. It is on the same reservation as the present hospital and so close that the building activity has caused some inconvenience to station operation. Despite this and the fact that some of the wards had to be torn down to make room for the new building, through various expedients the hospital work was conducted uninterruptedly and the full station bed-capacity was maintained.

COURT DECISIONS RELATING TO PUBLIC HEALTH

Bearing by counties of expense for public health work.—(Oklahoma Supreme Court; *Protest of Chicago, R. I. & P. Ry. Co.*, 23 P. (2d) 157, 158; decided June 13, 1933.) In cases involving protests against certain tax levies made by the excise boards of certain counties, the syllabi by the supreme court read, in part, as follows:

Under article 21 of the constitution of Oklahoma, an institution for the care of tubercular patients which is maintained by the State shall be at the expense of the State. That portion of section 5281, O.S. 1931, which attempts to place a portion of that tax burden upon the counties is in violation of the constitution and inoperative.

That portion of section 5281, O.S. 1931, which places the expense of caring for tubercular patients in a county, the expense of the prevention of conditions in a county that are predisposing causes of tuberculosis and other devastating diseases, the expense of prevention and control of epidemics in a county, the promotion of the public health in a county, and the expense of a county department of health, including compensation of its employees, upon that county, is a valid legislative enactment and is not in conflict with the provisions of article 21 of the constitution.

DEATHS DURING WEEK ENDED NOVEMBER 25, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Nov. 25, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	8,195	7,695
Deaths per 1,000 population, annual basis	11.5	11.0
Deaths under 1 year of age	599	579
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	52	47
Deaths per 1,000 population, annual basis, first 47 weeks of year	10.8	11.0
Data from industrial insurance companies:		
Policies in force	67,410,169	69,812,157
Number of death claims	13,329	10,950
Death claims per 1,000 policies in force, annual rate	10.3	8.2
Death claims per 1,000 policies, first 47 weeks of year, annual rate	9.8	9.5

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Dec. 2, 1933, and Dec. 3, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 2, 1933, and Dec. 3, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932
New England States:								
Maine	5	9	2	2	1	4	0	0
New Hampshire					26		0	0
Vermont	4				58		0	0
Massachusetts	20	35		4	372	83	0	3
Rhode Island	4	4			1	1	0	0
Connecticut	4	9	4	18	10	13	2	0
Middle Atlantic States:								
New York	48	50	[1] 30	[1] 17	363	653	2	9
New Jersey	29	50	19	13	44	242	1	0
Pennsylvania	76	140			258	347	5	3
East North Central States:								
Ohio	119	49	154	37	114	166	0	1
Indiana	96	117	46	247	31	10	3	0
Illinois	43	90	19	73	36	67	5	14
Michigan	23	20	3	2	52	272	0	0
Wisconsin	18	10	24	25	81	180	1	2
West North Central States:								
Minnesota	15	15		1	53	82	0	1
Iowa [2]	10	18			4	5	1	0
Missouri	79	66	7	123	41	12	2	0
North Dakota	23	13	2	1	15	49	0	0
South Dakota	5	10		1	219		0	1
Nebraska	4	48		4	6	3	0	0
Kansas	26	31		52	6	12	1	3
South Atlantic States:								
Delaware		4			1		0	0
Maryland [2]	23	16	17	16	2	4	0	1
District of Columbia	17	10	1	5	18	5	0	1
Virginia	89	50			46	113	3	1
West Virginia	56	40	57	36	2	77	4	1
North Carolina	62	61	9	11	347	58	4	2
South Carolina [3]	16	16	587	543	187	31	0	0
Georgia [3]	28	32		297	126	6	1	1
Florida	15	15	2	10	1	2	0	0
East South Central States:								
Kentucky	126	75	35	108	8		0	3
Tennessee	6	84	37	946	87	3	2	1
Alabama [3]	49	34	65	3,527	51	3	0	1
Mississippi [2]	25	35						0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 2, 1933, and Dec. 3, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 2, 1933	Week ended Dec 3, 1932	Week ended Dec. 2, 1933	Week ended Dec 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932
West South Central States:								
Arkansas	22	30	42	204	213	5	0	0
Louisiana [3]	36	34	4	1,183	3	3	0	2
Oklahoma [4]	73	50	29	152	43	2	3	0
Texas [3]	305	154	139	111	19	44	1	3
Mountain States:								
Montana	3	1	5			371	0	0
Idaho		3	1	19	5	2	0	0
Wyoming	1			1	34	5	0	0
Colorado	3	9	37	1,034	3	10	0	1
New Mexico	16	5	2	2,750	26	1	0	0
Arizona	8	4	21	688	3	1	0	0
Utah [2]	1	2		37	75		0	1
Pacific States:								
Washington	9	6		7	113	3	0	0
Oregon		2	14	284	22	41	0	0
California	38	69	57	1,702	162	47	2	3
Total	1,687	1,625	1,481	14,291	3,388	3,044	43	59

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec 2, 1933	Week ended Dec 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932
New England States:								
Maine	1	2	10	17	0	0	1	6
New Hampshire	0	0	22	10	0	0	0	0
Vermont	0	0	6	12	0	1	0	0
Massachusetts	1	1	171	277	0	0	1	2
Rhode Island	0	0	18	33	0	0	0	0
Connecticut	1	0	54	73	0	0	0	0
Middle Atlantic States:								
New York	5	0	380	603	0	16	5	9
New Jersey	0	1	133	183	0	0	6	5
Pennsylvania	6	4	494	538	0	0	23	35
East North Central States:								
Ohio	5	1	697	506	4	19	9	8
Indiana	1	0	198	142	2	7	7	12
Illinois	1	1	358	389	0	0	12	12
Michigan	0	2	203	211	3	3	6	3
Wisconsin	2	0	133	79	17	2	1	2
West North Central States:								
Minnesota	3	1	53	78	2	1	0	1
Iowa [2]	0	0	86	52	33	44	0	2
Missouri	0	0	163	138	1	0	10	3
North Dakota	0	0	37	5	0	0	1	0
South Dakota	0	1	11	19	0	0	0	0
Nebraska	1	1	23	65	2	4	5	0
Kansas	1	0	120	82	3	1	3	5
South Atlantic States:								
Delaware	0	0	5	12	0	0	3	0
Maryland [2]	3	2	96	85	0	0	5	6
District of Columbia	0	0	12	10	0	0	1	0
Virginia	0	0	133	61	0	0	13	7
West Virginia	2	0	151	74	1	0	6	14
North Carolina	0	0	156	111	0	0	3	17
South Carolina [3]	0	0	21	11	0	2	9	4
Georgia [3]	0	0	22	18	0	0	9	2
Florida	0	0	4	10	0	0	2	1
East South Central States:								
Kentucky	0	1	142	91	0	4	14	19
Tennessee	0	1	120	70	0	1	12	14
Alabama [3]	2	0	46	42	2	4	11	7
Mississippi [2]	0	1	24	28	1	1	4	5

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 2, 1933, and Dec. 3, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932
West South Central States:								
Arkansas	0	0	18	50	0	0	2	3
Louisiana [3]	0	0	29	18	4	3	9	5
Oklahoma [4]	0	0	64	30	0	0	17	7
Texas [3]	3	2	152	81	6	13	33	15
Mountain States:								
Montana	1	0	16	13	0	0	0	4
Idaho	0	0	5	0	6	4	0	3
Wyoming	0	0	8	8	0	0	1	0
Colorado	1	0	38	65	10	0	1	3
New Mexico	1	0	26	34	0	0	7	2
Arizona	1	0	8	6	0	0	1	0
Utah [2]	1	0	11	4	0	0	0	0
Pacific States:								
Washington	0	3	24	36	1	3	5	1
Oregon	4	0	49	26	7	4	1	1
California	4	3	164	152	6	2	27	8
Total	51	28	4,914	4,658	111	139	286	253

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Dec. 2, 1933, 35 cases, as follows: South Carolina, 1; Georgia, 16; Alabama, 15; Louisiana, 1; Texas, 2.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
October 1933										
Kansas	2	123	--------	2	22	--------	6	560	6	25
Mississippi	--------	229	1,674	12,860	182	363	1	150	7	30
Washington	7	48	35	--------	117	--------	10	127	10	14

October 1933

	Cases
Chicken pox:	
Kansas	197
Mississippi	141
Washington	376
Dengue:	
Mississippi	8
Dysentery:	
Mississippi (amoebic)	51
Washington (bacillary)	1
Enteritis:	
Washington (under 2 years)	6
Washington (over 2 years)	8
German measles:	
Kansas	6
Washington	13
Hookworm disease:	
Mississippi	745
Impetigo contagiosa:	
Kansas	17
Lethargic encephalitis:	
Kansas	43
Washington	2
Mumps:	
Kansas	68
Mississippi	68
Washington	127
Ophthalmia neonatorum:	
Kansas	1
Paratyphoid fever:	
Kansas	1
Puerperal septicemia:	
Mississippi	14
Washington	3
Rabies in animals:	
Mississippi	3
Washington	3
Septic sore throat:	
Kansas	7
Washington	4
Tetanus:	
Kansas	3
Tularaemia:	
Kansas	1
Typhus fever:	
Mississippi	1
Undulant fever:	
Kansas	2
Mississippi	3
Washington	2
Vincent's infection:	
Kansas	6
Whooping cough:	
Kansas	263
Mississippi	513
Washington	52

PLAGUE-INFECTED GROUND SQUIRREL, SANTA CLARA COUNTY, CALIF.

The Director of Public Health of the State of California reports that a ground squirrel shot 15 miles northeast of San Jose, near the Calaveras Dam, in the interior of Santa Clara County, Calif., was proved positive for plague by animal inoculation on November 29, 1933.

WEEKLY REPORTS FROM CITIES

City reports for week ended Nov. 25, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	0	3	0	0	0	2	6	26
New Hampshire:											
Concord	0	------	0	0	0	0	0	1	0	0	12
Manchester	0	------	0	4	0	2	0	0	0	0	13
Nashua	2	------	0	1	0	10	0	0	0	0	0
Vermont:											
Barre	0	------	0	51	0	2	0	0	0	2	3
Burlington	4	------	0	0	0	1	0	0	0	0	10
Massachusetts:											
Boston	3	------	0	127	28	55	0	10	0	65	226
Fall River	0	------	0	0	1	4	0	0	0	1	30
Springfield	0	------	0	0	1	2	0	2	0	14	33
Worcester	2	------	0	227	5	10	0	3	0	31	--------
Rhode Island:											
Pawtucket	0	------	0	0	0	0	0	0	0	0	20
Providence	1	------	1	0	2	6	0	2	1	24	56
Connecticut:											
Bridgeport	1	------	0	12	4	11	0	0	0	3	45
Hartford	0	------	0	0	2	18	0	1	1	0	44
New Haven	0	1	0	0	3	1	0	0	0	7	58
New York:											
Buffalo	5	------	2	43	29	17	0	7	0	25	136
New York	33	17	5	18	161	101	0	82	6	98	1,520
Rochester	0	------	0	1	7	6	0	0	0	10	71
Syracuse	0	------	0	0	6	7	0	0	1	55	46
New Jersey:											
Camden	1	------	0	0	3	7	0	1	0	0	38
Newark	2	5	2	5	12	16	0	3	0	16	88
Trenton	1	1	0	0	1	5	0	2	0	3	42
Pennsylvania:											
Philadelphia	6	14	9	109	50	72	0	15	2	37	571
Pittsburgh	2	4	2	0	17	23	0	12	0	58	163
Reading	0	------	0	3	1	4	0	2	0	5	23
Scranton	0	------	0	0	0	1	0	0	0	1	0
Ohio:											
Cincinnati	14	------	0	41	11	24	0	11	0	10	128
Cleveland	11	71	2	2	16	57	0	11	1	50	197
Columbus	4	------	0	1	6	51	0	4	0	6	95
Toledo	3	1	1	3	4	24	0	3	0	12	56
Indiana:											
Fort Wayne	6	------	1	0	6	2	0	1	0	0	30
Indianapolis	7	------	0	0	6	25	0	4	1	7	--------
South Bend	0	------	0	0	0	1	0	0	0	3	18
Terre Haute	1	------	0	23	2	6	0	0	0	0	15
Illinois:											
Chicago	1	11	4	4	52	157	0	30	0	92	681
Cicero	0	------	0	0	0	0	0	0	0	0	5
Springfield	9	------	0	2	2	3	0	1	0	5	20
Michigan:											
Detroit	7	3	0	12	28	50	0	23	1	87	250
Flint	0	------	0	1	2	26	0	0	0	10	21
Grand Rapids	0	------	0	0	1	4	0	0	0	1	31
Wisconsin:											
Kenosha	0	------	0	2	0	6	0	0	0	5	5
Madison	0	------	--------	0	--------	2	0	--------	0	20	30
Milwaukee	0	2	2	2	4	12	1	3	1	88	89
Racine	1	------	0	1	0	17	0	1	0	0	15
Superior	0	------	0	0	0	3	0	0	0	3	8

City reports for week ended Nov. 25, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
Minnesota:											
Duluth	0	......	0	0	3	3	0	2	0	1	25
Minneapolis	1	......	1	1	8	15	0	1	0	14	88
St. Paul	0	......	0	2	3	15	0	4	1	7	71
Iowa:											
Des Moines	3	......	......	1	......	25	0	......	0	0	36
Sioux City	4	......	......	0	......	5	0	......	0	3	......
Waterloo	0	......	......	0	......	0	0	......	0	1	......
Missouri:											
Kansas City	2	......	1	0	12	26	0	8	0	6	105
St. Joseph	1	......	0	0	1	2	0	0	0	0	13
St. Louis	23	......	......	29	13	19	0	12	3	26	191
North Dakota:											
Fargo	0	......	0	4	0	1	0	0	0	4	0
Grand Forks	0	......	0	0	0	0	0	0	0	3	0
South Dakota:											
Aberdeen	0	......	0	0	0	0	0	0	0	0	0
Sioux Falls	0	......	0	122	0	0	0	0	0	0	6
Nebraska:											
Omaha	0	......	0	13	4	15	9	3	0	8	50
Kansas:											
Topeka	0	......	0	1	0	4	0	1	0	6	5
Wichita	2	......	0	1	1	8	0	1	0	2	18
Delaware:											
Wilmington	1	......	0	0	2	2	0	2	0	2	22
Maryland:											
Baltimore	4	4	2	1	21	28	0	20	2	72	218
Cumberland	4	......	0	0	0	6	0	0	0	3	7
Frederick	0	......	0	0	0	1	0	0	0	0	3
District of Columbia:											
Washington	22	1	1	9	17	21	0	16	1	15	168
Virginia:											
Lynchburg	6	......	0	0	1	1	0	0	1	0	15
Norfolk	1	......	0	0	0	9	0	0	1	0	27
Richmond	7	......	0	0	5	10	0	1	1	0	46
Roanoke	7	......	0	1	0	8	0	0	0	0	9
West Virginia:											
Charleston	7	2	0	0	2	4	0	3	[1] 1	0	26
Huntington	3	......	0	0	0	17	0	0	0	0	0
Wheeling	0	......	0	0	3	12	0	0	0	2	17
North Carolina:											
Raleigh	0	......	0	0	1	9	0	0	0	3	4
Wilmington	0	......	0	0	1	0	0	0	0	0	8
Winston-Salem	11	......	0	193	2	15	0	1	0	0	22
South Carolina:											
Charleston	0	10	0	0	2	1	0	3	1	4	28
Columbia	0	......	0	0	9	0	0	1	0	0	46
Greenville	0	......	0	0	0	0	0	0	0	0	6
Georgia:											
Atlanta	21	20	5	1	10	3	0	8	0	7	81
Brunswick	0	......	0	0	0	0	0	0	0	3	2
Savannah	6	3	0	1	5	6	0	6	1	0	30
Florida:											
Miami	0	1	0	0	0	4	0	2	0	0	25
Tampa	3	1	1	0	1	0	0	2	0	0	25
Kentucky:											
Ashland	6	......	......	0	......	1	0	......	1	6	......
Lexington	6	5	0	0	2	4	0	2	0	6	15
Louisville	13	......	0	0	8	21	0	2	0	0	51
Tennessee:											
Memphis	8	......	1	3	11	13	0	3	1	1	74
Nashville	6	......	0	1	8	10	0	0	3	6	51
Alabama:											
Birmingham	3	3	1	0	4	10	0	4	2	0	59
Mobile	1	......	2	0	2	0	0	1	0	0	31
Montgomery	2	1	......	0	......	5	0	......	0	0	......
Arkansas:											
Fort Smith	2	......	......	1	......	0	0	......	0	1	......
Little Rock	3	......	0	0	2	5	0	0	0	0	2
Louisiana:											
New Orleans	15	3	0	3	8	8	0	12	2	0	152
Shreveport	5	......	0	0	2	4	0	1	0	0	36

[1] Imported.

City reports for week ended Nov. 25, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Texas:											
Dallas	30	1	1	0	5	9	0	1	0	0	58
Fort Worth	10		1	0	3	10	0	1	2	0	40
Galveston	0		0	0	6	1	0	3	0	0	20
Houston	16		0	0	8	6	0	3	0	0	70
San Antonio	5		1	1	6	3	0	6	0	0	77
Montana:											
Billings	0		0	0	0	0	0	0	0	0	9
Great Falls	0		0	0	0	0	0	1	0	0	10
Helena	0		0	0	0	0	0	0	0	0	0
Missoula	0		0	0	0	3	0	0	0	0	10
Idaho.											
Boise	0		0	1	0	1	0	0	0	0	6
Colorado:											
Denver	1	29	0	0	4	17	0	4	0	35	71
Pueblo	0		0	1	1	0	0	0	0	2	9
New Mexico:											
Albuquerque	0		0	0	0	2	0	4	1	0	8
Utah:											
Salt Lake City	0		0	117	2	8	0	1	1	5	23
Nevada:											
Reno	0		0	1	0	0	0	0	0	0	3
Washington.											
Seattle	0		1	0	3	12	0	2	2	40	74
Spokane	0			98	2	2	0		0	1	21
Tacoma	2		1	0	2	1	0	1	0	4	23
Oregon:											
Portland	0		0	2	2	16	1	2	0	0	67
Salem	0		0	0	0	0	0	0	0	1	0
California:											
Los Angeles	20	40	1	4	25	69	0	15	0	70	272
Sacramento	0	1	0	13	1	2	0	2	0	0	29
San Francisco	2	10	1	0	9	11	0	9	0	27	148

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts:			
Springfield	0	0	1
New York:			
New York	4	2	0
Pennsylvania:			
Philadelphia	1	0	2
Pittsburgh	0	0	1
Scranton	0	0	1
Ohio:			
Cleveland	0	0	2
Indiana:			
Indianapolis	2	0	0
Illinois:			
Chicago	4	3	1
Wisconsin:			
Milwaukee	1	0	0

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Minnesota:			
Minneapolis	0	0	2
Missouri:			
St. Joseph	1	0	0
St. Louis	1	0	0
Kansas:			
Topeka	1	0	0
Georgia:			
Atlanta	1	0	0
Louisiana:			
New Orleans	1	1	0
Oregon:			
Portland	0	0	1
California:			
Los Angeles	2	1	0
San Francisco	0	1	0

Lethargic encephalitis.—Cases: New York, 2; Pittsburgh, Pa., 1; Cleveland, 1; Milwaukee, 1; Kansas City, Mo., 3; St. Louis, 2; San Antonio, Tex., 1.

Typhus fever.—Cases: New York, 3; Norfolk, Va., 2; Atlanta, 2; Savannah, 2; New Orleans, 1; Houston, Tex., 1.

Pellagra.—Cases: Atlanta, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—Two weeks ended November 18, 1933.—During the 2 weeks ended November 18, 1933, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis					3					3
Chicken pox		7		326	500	182	56	35	168	1,274
Diphtheria	1	4	8	57	12	26	1	1		110
Dysentery					1					1
Erysipelas				7	5	3	1	2		18
Influenza		10		4	8	2			22	46
Lethargic encephalitis						2		1		3
Measles				265	67	1	6		1	340
Mumps					91	14	18		82	205
Paratyphoid fever					5					5
Pneumonia (all forms)		5			20		1		10	36
Poliomyelitis				6	3		2	1		12
Scarlet fever	6	8	15	146	230	43	5	16	122	591
Smallpox					1					1
Tuberculosis		1	12	102	53	21	44	6	39	278
Typhoid fever		2	3	49	14	4	3		6	81
Undulant fever					4					4
Whooping cough		5	9	277	162	54	10	19	43	579

CZECHOSLOVAKIA

Communicable diseases—September 1933.—During the month of September 1933, certain communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	4		Malaria	361	
Cerebrospinal meningitis	5	1	Paratyphoid fever	21	
Chicken pox	104		Poliomyelitis	28	1
Diphtheria	2,188	129	Puerperal fever	35	11
Dysentery	22		Scarlet fever	2,087	17
Influenza	17	1	Trachoma	140	
Lethargic encephalitis	1		Typhoid fever	729	46

TRINIDAD

Port of Spain—Vital statistics—1932.—During the year 1932, certain vital statistics were reported in Port of Spain, Trinidad, as follows:

Population	71,066
Total births	2,021
Birth rate per 1,000 population	28.44
Total deaths	1,125
Death rate per 1,000 population	15.83
Deaths under 1 year	207
Infant mortality rate per 1,000 births	102.42
Deaths from—	
Ancylostomiasis	1
Bright's disease and nephritis	71
Bronchitis	51
Cancer	44
Cardiac and vascular diseases	175
Diarrhea and enteritis	56
Dysentery	12
Influenza	3
Lethargic encephalitis	1
Malaria	36
Pneumonia	55
Syphilis	26
Tuberculosis	122
Typhoid fever	4

YUGOSLAVIA

Communicable diseases—October 1933.—During the month of October 1933, certain communicable diseases were reported in Yugoslavia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	80	2	Poliomyelitis	2	1
Cerebrospinal meningitis	4	3	Scarlet fever	527	15
Diphtheria and croup	994	101	Sepsis	9	4
Dysentery	226	34	Tetanus	49	26
Erysipelas	229	7	Typhoid fever	507	42
Measles	939	15	Typhus fever	41	5
Paratyphoid fever	15	1			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Nov. 24, 1933, pp. 1431–1442. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Dec. 29, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Philippine Islands.—During the week ended December 2, 1933, cholera was reported in the Philippine Islands as follows: Antique Province—Dao, 8 cases, 6 deaths. Bohol Province, Antequera, 2 cases, 2 deaths; Balilihan, 1 case; Calape, 3 cases, 1 death; Clarin, 2 cases, 1 death; Loon, 3 cases, 1 death; Tubigon, 40 cases, 20 deaths. Cebu Province—Argao, 5 cases, 5 deaths; Liloan, 3 cases; Naga, 4 cases,

3 deaths; Opon, 2 cases, 1 death; Toledo, 1 case, 1 death. Occidental Negros Province—San Carlos, 2 cases, 1 death.

Plague [1]

France—Marseille.—On November 7, 1933, one plague-infected rat was found on a dock at Marseille, France.

United States—California.—A report dated December 1, 1933, states that one ground squirrel shot in Santa Clara County, 15 miles northeast of San Jose, Calif., was proved positive for plague November 29, 1933.

Yellow Fever

Senegal.—During the week ended November 18, 1933, 1 case of yellow fever with 1 death was reported in Dakar, Senegal. On November 29, 1933, one case of yellow fever was reported in Kaolak, Nioro Circle, Senegal.

[1] Including plague in the United States.

X

UNITED STATES TREASURY DEPARTMENT

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IN THIS ISSUE

Summary of Current Prevalence of Communicable Diseases
Directory of State and Insular Health Authorities, 1933
Deaths in Large Cities During Week Ended December 2
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS are intended primarily for distribution to health officers, members of boards or departments of health, and those directly or indirectly engaged in or connected with public health or sanitary work. Articles of general or special interest are issued as reprints from the PUBLIC HEALTH REPORTS or as supplements, and in these forms are available for general distribution to those desiring them.

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PUBLIC HEALTH REPORTS

VOL. 48 DECEMBER 22, 1933 NO. 51

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES [1]

November 5–December 2, 1933

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the PUBLIC HEALTH REPORTS, under the section entitled "Prevalence of Disease."

Poliomyelitis.—Further decline in the incidence of poliomyelitis continued through the month of November. For the current 4-week period 268 cases were reported, as compared with 602 for the preceding 4-week period. In the New England and Middle Atlantic States, where the disease first appeared in epidemiclike form, the number of cases dropped from 262 for the 4 weeks ended November 4 to 94 for the current period; in the East North Central States the number dropped from 140 to 39; and in the West North Central from 98 to 29. The South Central and Mountain areas reported a slight increase and the Pacific area a decrease as compared with the preceding period. No increases above the normal seasonal expectancy have been reported this year from these areas.

The number of cases for the current period (268) was still high as compared with the normal years of 1932 and 1929 (approximately 1.4 times those years), but it was only about 42 percent of the number in 1931 and 30 percent of that in 1930—both epidemic years. The South Central areas reported practically the same incidence as last year, but all other areas reported increases ranging from 18 percent in the East North Central States to 93 percent in the West North Central area.

[1] From the Office of Statistical Investigations, U.S. Public Health Service. The numbers of States included for the various diseases are as follows: Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 47; diphtheria, 48; scarlet fever, 48; influenza, 38 States and New York City. The District of Columbia is counted as a State in these reports. These summaries include only the 8 important communicable diseases for which the Public Health Service receives weekly telegraphic reports from the State health officers.

Influenza.—During the current 4-week period 4,429 cases of influenza were reported. This number was only about 18 percent of that reported (24,673) for the corresponding period last year, when a sharp rise marked the appearance of an epidemiclike wave of influenza in the Mountain and Pacific and South Central areas. For this period in 1931, 1930, and 1929 the numbers of cases were 3,593, 4,009, and 4,927, respectively. The influenza situation is very favorable in all sections of the country, no section reporting more than the normal seasonal increase and none exceeding the incidence for the corresponding period of last year.

Smallpox.—For the 4 weeks ended December 2 there were 408 cases of smallpox reported. The current incidence approached very closely that of the corresponding period last year, when 430 cases were reported. For this period in 1931, 1930, and 1929 the numbers of cases were 1,124, 1,467, and 3,717, respectively. In the various geographic areas the New England and Middle Atlantic still remained free from the disease, while the East North Central and West North Central areas each reported a 25 percent decrease from last year's figure for this period; the South Atlantic States reported 9 cases as compared with 5 last year, and in the South Central areas the incidence was approximately the same as last year; the Mountain area reported 20 for the current period as against 68 last year, and the Pacific States reported 28 as against 61.

Diphtheria.—The number of cases of diphtheria dropped from 8,302 for the preceding 4-week period to 7,442 for the current period, which might indicate that the peakfor the current year was passed during that period (Oct. 8–Nov. 4). In each of the 2 preceding years the peak was reached during the 4 weeks corresponding to that period, while in the years 1930 and 1929 the peak was reached during the period corresponding to the current 4 weeks.

The current incidence was 1.1 times that for the corresponding period last year, but was only about 80 percent of the incidence in 1931. For this period in 1930 and 1929 the numbers of cases totaled 7,031 and 9,405, respectively. The South Atlantic and South Central areas seemed mostly responsible for the increase over last year. In each of those areas the incidence was approximately 1.4 times that of last year. In all other areas the disease was less prevalent than during this period last year.

Measles.—The usual seasonal increase of measles continued through the current 4-week period. The number of cases (10,567) was about 23 percent in excess of that for the corresponding period last year. In fact, for the entire reporting area the incidence was the highest for the 5 years for which data are available. A comparison of geographic areas shows that the situation in the South Atlantic, South

Central, and Mountain and Pacific areas was similar to that described for the country as a whole, while in the East North Central area the incidence was the lowest in the 5 years. The number of cases reported from the New England and Middle Atlantic areas was approximately the same as for last year, and the West North Central States reported 1,084 cases for the current period as against 707 and 461 for the years 1932 and 1931, respectively.

Scarlet fever.—The number of cases of scarlet fever (17,713) reported for the 4 weeks ended December 2 was the highest for this period in the 5 years for which data are available. All areas except the New England and Middle Atlantic and the East North Central contributed to the increase over last year. In those areas the disease was slightly less prevalent than at this time a year ago. For the corresponding period in the years 1932, 1931, and 1930 the numbers of cases were 16,938, 15,281, and 14,240, respectively.

Meningococcus meningitis.—For the current 4-week period 157 cases of meningococcus meningitis were reported—the lowest incidence for this period in the 5 years for which data are available. The South Atlantic States reported 27 cases, 1.8 times the number reported for the same period last year, and the West North Central area approximated last year's incidence; all other areas reported decreases ranging from 13 percent in the South Central groups to 65 percent in the Mountain and Pacific areas.

Typhoid fever.—The incidence of typhoid fever dropped approximately 1,000 cases during the 4 weeks ended December 2 as compared with the preceding 4 weeks. The number of cases (1,376) was 20 percent higher than that reported for the corresponding period last year, but only about 70 percent of the figure for 1931. For this period in 1930 and 1929 the numbers of cases totaled 2,234 and 1,496, respectively. The disease appeared to be most prevalent this year in the West North Central, South Central, and Mountain and Pacific areas. In each of those areas the number of cases reported for the current period was approximately 1.6 times that for the corresponding period last year. In other areas the disease was less prevalent than last year.

Mortality, all causes.—Deaths from all causes in large cities (as reported by the Bureau of the Census) for the 4 weeks ended December 2, was 11.2 per thousand population (annual basis). This rate was practically the same as the rates for the corresponding period in 1932 and 1931. In the first half of 1933 the death rate was very low in relation to recent years, but for the last several 4-week periods it has approximated the level of 1932 and 1931.

STATE AND INSULAR HEALTH AUTHORITIES, 1933

DIRECTORY, WITH DATA AS TO APPROPRIATIONS AND PUBLICATIONS

Directories of the State and insular health authorities of the United States for each year from 1912 to 1931 have been published in the Public Health Reports[2] for the information of health officers and others interested in public-health activities. The present directory (1933), like those formerly issued, has been compiled from information furnished by the respective State and insular health officers, and includes data as to appropriations and publications.

Where an officer has been reported to be a "whole-time" health officer, that fact is indicated by an asterisk (*). For this purpose a "whole-time" health officer is defined as "one who does not engage in the practice of medicine or in any other business, but devotes all of his time to official duties."

ALABAMA

Board of censors of the medical association of the State of Alabama, acting as a State committee of public health:
- B. M. Miller, governor, ex officio chairman, Montgomery
- W. D. Partlow, M.D., chairman, Tuscaloosa
- R. S. Hill, M.D., Montgomery
- Fred W. Wilkerson, M.D., Montgomery
- D. T. McCall, M.D., Mobile
- M. S. Davie, M.D., Dothan
- J. S. McLester, M.D., Birmingham
- M. Y. Dabney, M.D., Birmingham
- E. V. Caldwell, M.D., Huntsville
- S. A. Gordon, M.D., Marion
- C. A. Thigpen, M.D., Montgomery

Executive health officer:
- *J. N. Baker, M.D., State health officer, Montgomery

Administrative assistant:
- *D. L. Cannon, M.D., Montgomery

Secretary to State health officer:
- *Bessie A. Tucker, Montgomery

Financial secretary:
- *Adna Eley Alldredge, Montgomery

Registrar of vital statistics:
- *W. T. Fales, Montgomery
- *Ethel Hawley, chief clerk, Montgomery

Laboratories of the State board of health:
- General director:
  - *James G. McAlpine, Ph.D., Montgomery
- Anniston branch:
  - *Ellen Howell, Anniston
- Birmingham branch:
  - *George A. Denison, M.D., Birmingham
- Mobile branch:
  - *C. H. Waite, Mobile
- Tennessee Valley:
  - *C. C. Johnson, Decatur
- Tuscaloosa branch:
  - *Cannie Campbell, Tuscaloosa
- Selma branch:
  - *Cooper Brougher, Selma
- Dothan branch:
  - *Nellie K. Whitfield, Dothan
- Huntsville branch:
  - *Mrs. Buford Gatlin, Huntsville

Sanitation:
- Director:
  - *G. H. Hazlehurst, C.E., M.C.E., Montgomery
- Assistant engineers:
  - *H. G. Menke, B.C.E., Montgomery
  - *C. C. Kiker, B.C.E., Montgomery
  - *T. H. Milford, Montgomery

ALABAMA—Continued

Sanitation—Continued.
- Division of inspection:
  - *C. A. Abele, Ch.E., director, Montgomery
  - *H. J. Thrasher, assistant director, Huntsville
  - *F. D. Downs, dairy inspector, Montgomery

Communicable disease control:
- *D. G. Gill, M.D., D.P.H., director, Montgomery
- *W. E. Wilson, M.D., C.P.H., assistant director, Montgomery
- *R. A. Brown, M.D., Montgomery
- *Myrtle Martin, R.N., Montgomery

County organization:
- *B. F. Austin, M.D., director, Montgomery

Public health nursing:
- *Jessie L. Marriner, R.N., director, Montgomery
- *Frances C. Montgomery, R.N., Montgomery
- *Margaret Murphy, R.N., Montgomery
- *Catherine Corley, R.N., Montgomery

Appropriation for fiscal year ending Sept. 30, 1933: Annual appropriation for all health work, including county organization, $400,000. (Subject to proration on basis of available revenue coming into the general fund. This makes amount indeterminate.)

ALASKA

Executive health officer:
- Walter W. Council, M.D., commissioner of health, Juneau

Assistant commissioners of health:
- A. D. Haverstock, M.D., Seward
- Rex F. Swartz, M.D., Nome
- Floyd B. Gillespie, M.D., Fairbanks

Appropriation for 1933-35, $13,800.

ARIZONA

State board of health:
- B. B. Moeur, governor, president, Phoenix
- A. T. La Prade, vice president, Phoenix
- Geo. C. Truman, superintendent, secretary, Phoenix
- F. E. Doucette, executive secretary, Phoenix
- Fred Ruppelius, statistician, Phoenix
- Ralph Thomas, assistant secretary and auditor, Phoenix

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[2] Reprints Nos. 83, 123, 1?0, 2?6, 341, 405, 488, 544, 605, 700, 775, 871, 919, 1043, 1106, 1188, 1254, 1331, 1425, 1522, from the Public Health Reports.

ARIZONA—Continued

Executive health officer:
George C. Truman, M.D., State superintendent of health, Phoenix
State laboratory:
Jane Rider, director, Tucson
Marion Stroud, bacteriologist, Phoenix
W. B. West, assistant bacteriologist, Tucson
Fred Baker, assistant bacteriologist, Phoenix
Epidemiologist:
*H. F. Stanton, M.D.
Sanitary engineer.
*F. C. Roberts
County health units:
*A. N. Crain, M D., medical director, Maricopa County, Phoenix
*R B Durfee, M.D., medical director, Cochise County, Bisbee
*Geoffrey Morris, M.D , medical director, Pima County, Tucson
*Anson B. Ingels, M D., medical director, Gila County, Globe
Appropriations for laboratory, year ending June 30, 1934.

Salaries	7,440
Operation	1,621
	9,061

ARKANSAS

Board of health:
E. D. McKnight, M.D., president, Brinkley
W. F. Smith, M.D., Little Rock
Thos. Wilson, M.D., Wynne
J. G. Gladden, M.D., Western Grove
L. D. Duncan, M.D., Waldron
W. G. Hodges, M D , Malvern
F. O. Mahony, M.D., El Dorado
Executive health officer:
*Wm. B. Grayson, M.D., State health officer, Little Rock
Bureau of vital statistics:
*Mrs. J. B. Collie, statistician, Little Rock
Hygienic laboratory:
*H. V. Stewart, associate director, Little Rock
Bureau of sanitation and malaria control:
*M. Z. Bair, B.Sc.E., chief sanitary engineer, Little Rock
Bureau of child hygiene:
——— ———
County health units:
*Gordon Hastings, M.D., director, Little Rock
Appropriations for biennial period ending June 30, 1935:

Executive department, salaries and miscellaneous	$23,000
Bureau of vital statistics	28,000
Bureau of sanitation	2,500
Hygienic laboratory	14,840
County health units and rural sanitation	160,000

CALIFORNIA

Board of public health:
Howard Morrow, M.D., president, San Francisco
Edward M. Pallette, M.D., vice president, Los Angeles
Giles S. Porter, M.D., director of public health, Sacramento
Gifford L. Sobey, M.D., Paso Robles
William R. P. Clark, M.D., San Francisco
George H. Kress, M.D., Los Angeles
Junius B. Harris, M.D., Sacramento
Department of public health:
*Giles S. Porter, M.D., director of public health, Sacramento
District health officer:
*Gavin Telfer, M.D., southern division
Bureau of sanitary inspections:
*Edward T. Ross, chief, Sacramento
Bureau of vital statistics:
*Mrs. Marie B. Stringer, registrar, Sacramento

CALIFORNIA—Continued

Bureau of registration nurses:
*Helen F. Hansen, chief, Sacramento
Bureau of tuberculosis
*Edyth L. M. Tate-Thompson, chief, Sacramento
Bureau of food and drug inspections:
*M. P. Duffy, chief
Bureau of laboratories
*W. H Kellogg, M.D., chief, Berkeley
Bureau of sanitary engineering:
*C. G. Gillespie, C.E., chief, Berkeley
Bureau of child hygiene:
*Ellen S. Stadtmuller, M.D., chief, San Francisco
Appropriations, available July 1, 1933, for biennial period ending June 30, 1935 (85th and 86th years):

Administration:	
For support, department of public health	$401,612
Bureau of cannery inspection:	
For support (payable from cannery-inspection funds)	133,920
Bureau of registration of nurses:	
For support (payable from nurses registration funds)	38,760
Tuberculosis bureau:	
Allotment for support, included in item "for support, department of public health", $18,040.	
For subsidies	975,000
Total	1,549,292

Other sources of revenue:
Fees for registration of nurses, $10 each. (Fees for California graduate nurses, $5 only)
Renewal of registration certificates, $1 each per year
Licensing of cold storage warehouses, rated according to capacity, for credit to general fund
Fines for violation of pure food and drugs act, for credit to general fund
Fees for licenses, $50 each, and contributions, for credit to bureau of cannery inspection
Fees for searches and certified copies of records, for credit to general fund
Fees for inspection and registration of aviaries, $5 each
Fees for inspection of clinics and dispensaries, $5 each
Publications issued by health department:
Biennial report
Weekly bulletin

COLORADO [3]

Board of health:
Sherman Williams, M.D., president, Denver
S. R. McKelvey, M.D., secretary, Denver
N. M. Burnett, M.D., Lamar
Ben Beshoar, M.D., Trinidad
Paul J. Connor, M.D., Denver
G. W. Bumpus, D.O., Denver
C. A. Davlin, M.D., Alamosa
Ura O. Musick, Colorado Springs
William P. Gasser, M.D., Loveland
Executive health officer:
*S. R. McKelvey, M.D., secretary, State board of health, Denver
Bacteriologist:
William C. Mitchell, M.D., Denver
Epidemiologist:
Merrill C. Jobe, M.D., Denver
State food and drug commissioner:
*S. H. Loeb, Denver
Division of social hygiene:
*S. R. McKelvey, M.D., director, Denver
Division of sanitary engineering:
*Benjamin V. Howe, director, Denver
Division of plumbing inspection:
*Irving H. Fuller, inspector, Denver

[3] Data received for publication in 1932.

COLORADO—Continued

Appropriations for fiscal years ending June 30, 1930 and 1931:

	1930	1931
Salaries	$27,300	$27,300
Laboratory equipment and supplies	2,000	2,000
Printing and publications	2,800	2,800
Traveling expenses	5,000	5,000
Samples and supplies (food)	300	300
Venereal disease	20,000	20,000
Incidental expenses	1,750	1,750
Total	59,150	59,150

CONNECTICUT

Public health council:
C.-E. A. Winslow, D.P.H.
James W. Knox
James A. Newlands
David R. Lyman, M.D.
Robert A. Cairns, C.E.
Joseph M. Ganey, M.D.
Executive health officer:
*Stanley H. Osborn, M.D., C.P.H., commissioner of health, Hartford
Bureau of preventable diseases:
*Millard Knowlton, M.D., C.P.H., director
Bureau of vital statistics:
*William C. Welling, director
Bureau of public-health nursing:
*Agnes F. Sullivan, acting director
Bureau of child hygiene:
*A. Elizabeth Ingraham, M.D.
Bureau of public-health instruction:
*Elizabeth C. Nickerson, C.P.H.
Bureau of laboratories:
*F. Lee Mickle, director
Bureau of sanitary engineering:
*Warren J. Scott, director
Bureau of occupational diseases:
*Albert S. Gray, M.D., director
Bureau of venereal diseases:
*Henry P. Talbot, M.D., director
Bureau of mental hygiene:
——————
Division of mouth hygiene:
Clyde R. Salmons, D.D.S., chief
Division of medical registration:
*Ruth H. Monroe, chief
Appropriation for fiscal period ending June 30, 1935 (2 years), $569,664.
Publications issued by health department:
Weekly bulletin
Monthly bulletin
Annual vital-statistics report
Annual report of State department of health
Miscellaneous pamphlets

DELAWARE

State board of health:
William P. Orr, M.D., president, Lewes
Mrs. Charles Warner, vice president, Wilmington
Robert E. Ellegood, M.D., Wilmington
Margaret I. Handy, M.D., Wilmington
Mrs. F. G. Tallman, Wilmington
Stanley Worden, M.D., Dover
Mrs. Arthur Brewington, Delmar
Charles R. Jefferis, Jr., D.D.S., Wilmington
Executive health officer:
*Arthur C. Jost, M.D., C.M., Dover
Director of laboratory:
*Rowland D. Herdman, Dover
Director of child hygiene:
*Clealand A. Sargent, M.D., Dover
Sanitary engineer:
*Richard C. Beckett, Dover
Superintendent of Brandywine Sanatorium:
*Lawrence D. Phillips, M.D., Marshallton
Superintendent of Edgewood Sanatorium:
*Elizabeth Van Vranken, R.N., Marshallton

DELAWARE—Continued

State oral hygienist.
Miss M. E. Wagner, R.N.
County unit officers:
*J. R. Downs, M.D., New Castle County
*E. F. Smith, M.D., Kent County
*J. B. Derrickson, M.D., Sussex County
Appropriations for each fiscal year ending June 30, 1934 and 1935:

General administration	$81,000
Hygienic laboratory	10,000
Edgewood Sanatorium for colored tuberculous patients	27,000
Brandywine Sanatorium for white tuberculous patients	120,000
Dental hygiene	12,000
Total	250,000

Publications:
Annual report
Bulletins on health subjects
Weekly circular

DISTRICT OF COLUMBIA

Executive health officer:
*William C. Fowler, M.D., health officer, Washington
Assistant health officer:
*Edward J. Schwartz, M.D., Washington
Chief clerk and deputy health officer:
*Arthur G. Cole, Washington
Chief, bureau of preventable diseases, and director bacteriological laboratory:
*James G. Cumming, M.D , Washington
Bacteriologist:
*John E. Noble, Washington
Serologist:
*Jesse P. Porch, D.V.M., Washington
Chemist:
*John B. Reed, Washington
Chief sanitary inspector:
*J. Frank Butts, Washington
Director child-hygiene service:
*Hugh J. Davis, M.D., Washington
Chief food inspector:
*Reid R. Ashworth, D.V.S., Washington
Chief medical and sanitary inspector of schools:
*Joseph A. Murphy, M.D., Washington
Micro-analyst:
*Edwin R. Donaldson, Washington
Appropriations for the fiscal year ending June 30, 1934:

Salaries	$155,000
Prevention of communicable diseases	28,000
Isolation wards at hospitals	22,500
Milk and food inspection and regulation	6,000
Dispensary service, including treatment of tuberculosis and venereal diseases	33,112
Maintaining a child-hygienic service	44,000
Hygiene and sanitation, public schools	80,000
Laboratory service	2,000
Miscellaneous	1,300
Total	371,912

Publications issued by health department:
Weekly report by health department
Annual report of health officer
Monthly statement of average grade of milk sold

FLORIDA

Board of health:
N. A. Baltzell, M.D., president, Marianna
Leland H. Dame, M.D., Inverness
Harry Dash Johnson, M.D., Daytona Beach
Executive health officer:
*Henry Hanson, M.D., State health officer, Jacksonville
Diagnostic laboratories:
*Paul Eaton, M.D., D.P.H., director, Jacksonville
Bureau of vital statistics:
*Stewart G. Thompson, D.P.H., director, Jacksonville
Bureau of communicable diseases:
*F. A. Brink, M.D., director, Jacksonville

FLORIDA—Continued

Bureau of sanitary engineering:
*Louva G Lennert, director, Jacksonville
Division of public health nursing.
*Joyce Ely, R.N., acting director
Appropriation for health department:
One-half mill tax levied upon the assessable property of the State for the year ending June 30, 1933, to be supplemented from the general fund. Appropriation, 1933-35, $179,600 annually
Publications issued by health department:
Pamphlets covering all phases of public health
Public health information disseminated through the weekly and daily papers of the State
Florida health notes
Annual reports

GEORGIA

Department of health:
State board of health:
Dr. Cleveland Thompson, Millen, First District
Dr. C. K Sharp, Arlington, Second District
Mr. R. C. Ellis, Americus, Third District
Dr. M. M. Head, Zebulon, Fourth District
Mr. R. F. Maddox, Atlanta, Fifth District
Dr. A. R. Rozar, Macon, Sixth District
Dr. M. M. McCord, Rome, Seventh District
Dr. H. W. Clements, Adel, Eight District
Dr. L. C. Allen, Hoschton, Ninth District
Dr. W. A. Mulherin, Augusta, Tenth District
Dr. T. C. Marshall, Atlanta, State at large
Dr. Claude Rountree, Thomasville, State at large
Dr. M. H. Varn, Atlanta, State at large
Dr. R. F. Sullivan, Savannah, State at large
Executive health officer:
*T. F. Abercrombie, M.D., director, Atlanta
*J. P. Bowdoin, M.D., assistant director
Division of venereal-disease control:
*Joe P. Bowdoin, M.D., chief, Atlanta
Division of county health work:
*M. E. Winchester, M.D., chief, Atlanta
Division of laboratories:
*T. F. Sellers, chief, Atlanta
Division of sanitary engineering:
*L. M. Clarkson, chief, Atlanta
Bureau of vital statistics:
*Butler Toombs, chief, Atlanta
Division of child hygiene:
*Joe P. Bowdoin, M.D., chief, Atlanta
Division of accounting and purchasing:
*C. L. Tinsley, chief, Atlanta
Appropriations for the fiscal year ending Dec. 31, 1933:

General appropriation	$148,000
Trachoma	10,000
Total	158,000

HAWAII TERRITORY

Board of health:
F. E. Trotter, M.D., president and executive officer, Honolulu
Harry R Hewitt, attorney general, Honolulu
Grover A. Batten, M.D., Honolulu
Donald S. Bowman, Honolulu
Alan S. Davis, Honolulu
James A. Williams, Honolulu
J. Platt Cooke, Honolulu
Executive health officer:
*F. E. Trotter, M.D., president of the board of health, Honolulu
Secretary:
*Mae R. Weir, Honolulu
Bureau of sanitation and pure food:
*S. W. Tay, director, Honolulu
*F. K. Schultz, division supervisor, Honolulu
*Clifford H. Bowman, division supervisor, island of Hawaii, Hilo
*R. C. Lane, division supervisor, island of Maui, Wailuku
*A. P. Christian, division supervisor, island of Kauai, Lihue
*Robert B. Pauole, sanitary inspector, Leeward Molokai, Kaunakakai

HAWAII TERRITORY—Continued

Health officer, island of Hawaii:
*Joseph S. Caceres, Hilo
Bureau of vital statistics:
*M. H. Lemon, registrar general, Honolulu
Laboratory technician:
*Mary L. Goodknight, Honolulu
Tuberculosis bureau:
C. Alvin Dougan, M.D., director
Bureau of public health nursing:
*Mabel L. Smyth, R.N., director, Honolulu
Food commissioner and analyst:
*M. B. Bairos, Honolulu
Territorial hospital:
*A. B. Kroll, superintendent, Kaneohe, Oahu
*A. B. Eckerdt, M.D., medical director, Kaneohe, Oahu
Bureau of communicable diseases:
Frederick K. Lam, M.D., director, Honolulu
Health officer, island of Kauai:
A. M. Ecklund, M.D., Koloa
Bureau of maternal and infant hygiene and child welfare:
Frederick K. Lam, M D., director, Honolulu
Bacteriologist, island of Hawaii:
*Fred S. Paine, Hilo
Bacteriologist, island of Maui:
Haliburton McCoy, M.D., Puunene
Bacteriologist, island of Kauai:
A. M. Ecklund, M.D., Koloa
Appropriations, 1933-35:

Board of health—general administration:	
Personal services	$44,000.00
Other current expenses	7,000.00
Bureau of vital statistics:	
Personal services	20,000.00
Other current expenses	2,000.00
Tuberculosis—Government hospital (Puumaile Home):	
Personal services	47,017.50
Other current expenses	58,000.00
Equipment	481.10
Tuberculosis bureau:	
Personal services	14,040.00
Other current expenses	9,060.00
Equipment	900.00
Tuberculosis—private hospitals:	
Contributions to Leahi Home	144,000.00
Contributions to Kula Sanitarium	76,800.00
Contributions to Samuel Mahelona Memorial Hospital	55,500.00
Bureau of public health nursing:	
Personal services	135,108.00
Other current expenses	10,000.00
Plague campaign:	
Personal services	36,648.00
Other current expenses	9,352.00
Bureau of communicable diseases:	
Personal services	20,000.00
Other current expenses	20,000.00
Bureau of maternal and infant hygiene:	
Personal services	6,400.00
Other current expenses	1,800.00
Boards of examiners:	
Personal services	216.00
Other current expenses	405.00
Sanitation and pure food:	
Personal services	91,898.00
Other current expenses	10,000.00
Equipment	230.00
Agents—Government physicians:	
Personal services	76,180.00
Territorial hospital:	
Personal services	320,784.00
Other current expenses	140,296.00
Equipment	500.00
Structures and improvements	2,000.00
Total	1,360,615.60

Publications issued by health department:
Annual report of president
Registrar General's report
Monthly morbidity and mortality report

IDAHO

Department of public welfare:
*Lewis Williams, commissioner
*W. V. Leonard, B.S.M.E., State chemist and sanitary engineer
*Lawrence J. Peterson, bacteriologist
*A. W. Klotz, assistant chemist
*R. J. Harding, dairy, food, drug, hotel, and sanitary inspector
*James M. Welsh, dairy, food, drug, hotel, and sanitary inspector
Executive health officer:
***Lewis Williams**, commissioner of public welfare, Boise
Bureau of child hygiene:
*Mrs. Deborah H. Worthington, director, Boise
Appropriations for biennial period ending Dec 31, 1934:

Personal services	$35,205
Other expenses	12,605
Venereal-disease control	1,500
Vaccines and antitoxins	2,000
Child hygiene	2,860
Total	54,170

ILLINOIS

Board of public-health advisors:
Herman N. Bundesen, M.D., chairman
Charles DeCenter, M.D.
Walter W. Hamburger, M.D.
Clifford U. Collins, M.D.
W. A. Evans, M.D.
Executive health officer:
***Frank J. Jirka, M.D.**, director of public health, Springfield
Assistant director of public health:
*A. C. Baxter, M.D.
Division of sanitation and engineering:
*Harry F. Ferguson, C.E., chief sanitary engineer
Division of communicable diseases:
*J. J McShane, M.D., D.P.H., chief
Division of child hygiene and public-health nursing:
*Grace S. Wightman, M.D., chief
Division of tuberculosis:
*A. C. Baxter, M.D., acting chief
Division of laboratories:
*Howard J. Shaughnessy, Ph.D., chief
Division of vital statistics.
*Sheldon L. Howard, registrar
Division of public-health instruction:
*Baxter K. Richardson, chief
Division of hotel and lodging-house inspection:
*Courtney Scobell, superintendent
Appropriations for biennial period ending June 30, 1935:

Salaries	$674,960
Salaries State officers	27,800
Office expenses	23,176
Traveling expenses	128,661
Operation	269,116
Repairs and equipment	17,875
Contingent	15,000
Printing	50,000
Postage	25,000
Sanitary water board law	20,000
Rabies	12,000
Emergency	25,000
Total	1,288,588

Publications issued by health department:
Illinois Health Messenger (bimonthly)
Weekly press bulletin
Educational health circulars

INDIANA

Board of health:
John Clay Glackman, M.D., president, Rockport
Edmund M. Van Buskirk, M.D., Fort Wayne
Ernest Rupel, M.D., Indianapolis
Verne K. Harvey, M.D., secretary, Indianapolis
Executive health officer:
***Verne K. Harvey, M.D., C.P.H.**, director, Indianapolis

INDIANA—Continued

Collaborating epidemiologist and assistant director:
*Thurman B. Rice, M D., Indianapolis
Epidemiologist:
*J. W. Jackson, M D., Indianapolis
Bureau of vital statistics:
*H. M. Wright, statistician and registrar, director, Indianapolis
Bacteriological laboratory:
*Clyde G. Culbertson, M.D., director, Indianapolis
Division of chemistry:
*Martin L. Lang, State food and drug commissioner, Indianapolis
Bureau of dairy products:
*John Tylor, director, Indianapolis
Bureau of sanitary engineering:
*Louis A. Geupel, B.S.C.E., director, Indianapolis
Food and drug laboratory:
*Frank J. Koehne, B.Ch.E., director, Indianapolis
Bureau of health education:
*Bynum Legg, director, Indianapolis
Bureau of housing, industrial and school hygiene:
*Fred K. Myles, director, Indianapolis
Bureau of public-health nursing:
*Eva F. MacDougal, R.N., director, Indianapolis
Appropriations for each of fiscal years beginning July 1, 1933 and 1934, $207,300.

IOWA

State department of health:

EX OFFICIO

Clyde L. Herring, governor, Des Moines
Mrs. Alex Miller, secretary of state, Des Moines
Leo Wegman, treasurer of state, Des Moines
Ray Murray, secretary of agriculture, Des Moines
Walter L. Bierring, M.D., State commissioner of health, Des Moines

APPOINTIVE BY GOVERNOR

C. A. Boice, M.D., president, Washington
T. D. Kas, M.D., secretary, Sutherland
J. F. Aldrich, M.D., Shenandoah
C. W. Ellyson, M.D., Waterloo
J. M. Smittle, M.D., Waucoma
Executive health officer:
***Walter L. Bierring, M.D.**, commissioner of health, Des Moines
*Frederick J. Swift, M.D., deputy commissioner
Executive clerk:
*Lynn Clemens, Des Moines
Division of child health and health education:
*Joseph H. Kinnaman, M.D., Des Moines
Division of epidemiology:
*Carl F. Jordan, M.D., C.P.H., Des Moines
State hygienic laboratories:
*M. E. Barnes, M.D., Dr.P.H., director, Iowa City
Division of public health nursing:
*Edith S. Countryman, R.N., director, Des Moines
Division of nursing education:
*Maude E. Sutton, R.N., director, Des Moines
Division of vital statistics:
*Robert L. McLaren, director, Des Moines
Division of licensure and registration:
*H. W. Grefe, director, Des Moines
Division of law enforcement:
*Herman B. Carlson, attorney, Des Moines
Division of sanitary engineering:
*A. H. Wieters, C.E., director, Des Moines
Division of barber inspection:
*William B. Wilson, director, Des Moines
Division of cosmetology inspection:
*Naomi M. Krause, director, Des Moines
Housing work is carried on by engineering division.
Medical, nurses, dental, optometry, cosmetology, chiropractic, osteopathy, embalming, podiatry, and barber examining boards are combined in State department of health.

IOWA—Continued

Appropriations for fiscal year ending June 30, 1934:

For salaries, support, maintenance and miscellaneous purposes	$45,340
For child-health and health education	6,600
For inspector salaries, support, maintenance, and miscellaneous	4,200
For sanitary engineering and housing salaries, support, maintenance, and miscellaneous	18,900
For barber-inspection salaries, support, maintenance, and miscellaneous	15,150
For division of cosmetology inspection salaries, support, maintenance, and miscellaneous	11,360
Total	101,550

Publications:
- Biennial report
- Quarterly bulletin
- Weekly health message

KANSAS

Board of health:
- J. L. Lattimore, M D., president, Topeka
- H. L Aldrich, M.D., Caney
- George I. Thacher, M.D., Waterville
- R. S. Haury, M.D., Newton
- Charles W. Robinson, M.D., Atchison
- Clay E. Coburn, M.D., Kansas City
- H. A. Browne, M D , Galena
- L. V. Turgeon, M.D., Wilson
- C. L Hooper, M.D., Dodge City
- Frazor Edmondson, LL.B., Topeka

Executive health officer:
- *Earle G. Brown M.D., secretary State board of health, Topeka

Division of vital statistics:
- *C. L. Miller, M.D , State registrar.

Division of communicable diseases:
- *C. H. Kinnaman, M.D., epidemiologist, Topeka

Division of foods and drugs:
- *Thomas I. Dalton, Ph.C., assistant chief food and drug inspector, Topeka

Division of child hygiene:
- *J. C. Montgomery, M.D , chief, Topeka

Division of rural sanitation:
- *J. C. Montgomery, M.D., director, Topeka

Division of sanitation:
- Earnest Boyce, chief, Lawrence

Division of public-health education:
- *Earle G. Brown, M.D., director, Topeka

Water and sewage laboratories at Kansas University:
- Earnest Boyce, director, Lawrence

Food laboratory at Kansas University:
- H. P. Cady, director

Drug laboratory at Kansas University:
- Prof. L. D. Havenhill, director of drug analysis, Lawrence

Food laboratory at Kansas Agricultural College:
- Prof. H. H. King, director of food analysis, Manhattan

Public health laboratory, Topeka:
- *Ross L. Laybourn, bacteriologist, in charge.

Appropriations for year ending June 30, 1934:

	Salaries	Total
Executive	$4,400	$6,000
Division of communicable diseases	4,800	15,210
Division of food and drugs	8,140	12,140
Division of child hygiene	5,760	8,000
Division of cooperative county health work		6,000
Public health laboratory	4,010	8,300
Division of sanitation (Engineering, water, and sewage)		2,400
Board members	200	800
Total	27,310	58,850

KANSAS—Continued

Other sources of revenue.
- Marriage fees, approximately $20,000
- Water and ice analysis fees, approximately $14,000

Publications issued by health department:
- Biennial report
- Weekly morbidity report

KENTUCKY

Board of health:
- E M. Howard, M.D., president, Harlan
- George S. Coon, M D., Louisville
- A. T. McCormack, M D., secretary, Louisville
- J. Watts Stovall, M.D , Grayson
- Lawrence T. Minish, M.D , Frankfort
- B. B. Keys, M.D , Murray
- F. L. Johnson, M.D., Livermore
- C J Johnson, D.O.. Louisville
- James F. Wilson, Mayfield
- Jas. J. Goodwin, Louisville

Executive health officer:
- *A. T. McCormack, M.D., D.P.H., State health officer, Louisville

Bureau of county health work:
- *P E. Blackerby, M D., assistant State health officer, Louisville
- *V. A. Stilley, M D., assistant field director, Benton

Bureau of vital statistics:
- *J. F. Blackerby, director, Louisville

Bureau of bacteriology:
- *Lillian H. South, M.D., director, Louisville

Bureau of sanitary engineering:
- *F C. Dugan, S.E., director, Louisville

Bureau of food, drugs, and hotels:
- *Sarah Vance Dugan, director, Louisville

Bureau of venereal diseases:
- Jethra Hancock, M.D., Louisville

Bureau of public health nursing:
- *Margaret L. East, R.N., director, Louisville

Bureau of maternal and child health:
- *Annie S. Veech, M.D., director, Louisville
- *Juanita Jennings, M.D., assistant director, Louisville

Bureau of prevention of trachoma and blindness:
- United States Trachoma Hospital.
  - *Robert Sory, M D , medical officer in charge

Bureau of budget:
- *Elva V. Grant, director, Louisville

Bureau of epidemiology:
- *J. L Jones, M.D., director, Louisville

Bureau of tuberculosis and State tuberculosis sanatorium:
- *Paul A. Turner, M.D., director and superintendent, Louisville

Bureau of dental health:
- J. F. Owen, D.D.S., director. Lexington

Appropriations for fiscal year ending June 30, 1934:

Central administration for all departments	$145,200
Full-time county health departments	188,000
State tuberculosis sanatorium	12,500
Total	345,700

Publications issued by health department:
- Monthly bulletin

LOUISIANA

State board of health:
- J. A. O'Hara, M.D., president, New Orleans
- S. E. Graham, M.D., Melville
- S. J. Couvillon, M.D., Moreauville
- J. L. Kelly, M.D., Oak Grove
- (Other members to be appointed)
- Fannie B. Nelken, secretary

Executive health officer:
- J. A. O'Hara, M.D., president, State board of health, New Orleans

Bacteriologist:
- W. H. Seemann, M.D., New Orleans

Registrar of vital statistics:
- J. George Dempsey, M.D., New Orleans

Bureau of communicable diseases:
- C. L. Brown, M.D.

LOUISIANA—Continued

Bureau of mental hygiene
H. R. Unsworth, M.D., New Orleans
Bureau of research and information:
P. A. Kibbe, M.D.
Bureau of public health administration.
*George S. Bote, executive assistant, U.S.P.H.S., acting director, New Orleans
Sanitary engineer:
*John H. O'Neill, New Orleans
Analyst:
*Cassius L. Clay, New Orleans
Bureau of animal industry:
*G. T. Jackson, D.V.S., director, New Orleans
Sanitary inspection:
*Peter Rohrs, Jr., chief, New Orleans
Auditor:
*Phil Arras, New Orleans
Appropriations for fiscal year:

1932-33	$395,000
1933-34	431,000

Publications issued by health department:
Quarterly bulletin
Biennial report
Miscellaneous leaflets

MAINE

Department of health and welfare:
Bureau of health:
George H. Coombs, M.D., director, Augusta
Advisory council of health and welfare:
Miss Sally P. Moses, Bangor
George W. Lane, Jr., Auburn
Mrs. Dora B. Pinkham, Fort Kent
Walter G. Davis, Portland
Mrs. Helen C. Donahue, Portland
E. V. Call, M.D., Lewiston
Division of administration:
*George H. Coombs, M.D., Augusta
Division of communicable diseases:
*George H. Coombs, M.D., Augusta
Division of laboratories:
*A. H. Morrell, M.D., Augusta
Division of sanitary engineering:
*Elmer W. Campbell, D.P.H., Augusta
Division of vital statistics:
*George H. Coombs, M.D., State registrar, Augusta
Division of social hygiene:
*George H. Coombs, M.D., Augusta
Division of public health nursing and child hygiene:
*Edith L. Soule, R.N., Augusta
Division of dental hygiene:
*Dorothy Bryant, D.H., Augusta
District health officers:
*J. L. Pepper, M.D., South Portland
*R. L. Mitchell, M.D., Lewiston
*J. W. Loughlin, M.D., Newcastle
*B. F. Porter, M.D., Caribou
Appropriations for fiscal year ending June 30, 1933:

Salaries and clerk hire	$36,400
Office expense and epidemic fund	20,900
District and local health officers	29,600
Venereal-disease control work	9,700
Maternity and child-welfare work	26,300
Branch State laboratory, Caribou	2,900
Aid for typhoid carriers	4,800
Completion of vital records of the State	400
Infantile-paralysis control	2,000
Total	133,000

Other sources of revenue:
Census Bureau, Washington, D.C., about $533
License fees for camps, roadside eating and lodging places, about $11,000 (estimated)

MARYLAND

Board of health:
Robert H. Riley, M.D., Dr.P.H., chairman, Baltimore
Thomas S. Cullen, M.D., Baltimore
Wm. F. Lane, Jr., attorney general, Baltimore

MARYLAND—Continued

Board of health—Continued
William W. Ford, M.D., Baltimore
Huntington Williams, M.D., Dr.P.H., Baltimore
Tolley A. Biays, C.E., Baltimore
Benjamin C. Perry, M.D., Bethesda
E. F. Kelly, Phar.D., Baltimore.
Burt B. Ide, D.D.S., Baltimore
Executive health officer:
*Robert H. Riley, M.D., Dr.P.H., director of health, Baltimore
Division of personnel and accounts:
*Walter N. Kirkman, chief, Baltimore
Division of oral hygiene:
*Richard C. Leonard, D.D.S., chief, Baltimore
Division of legal administration:
*J. Davis Donovan, LL.B., chief, Baltimore
Committee on public health education:
*Gertrude B. Knipp, secretary, Baltimore
Bureau of communicable diseases:
*Robert H. Riley, M.D., Dr.P.H., chief, Baltimore
*C. H. Halliday, M.D., epidemiologist, Baltimore.
*C. W. G. Rohrer, M.D., Ph.D., diagnostician, Baltimore
Bureau of vital statistics:
*John Collinson, M.D., Dr.P.H., chief, Baltimore
Food and drug commissioner:
*A. L. Sullivan, chief, Baltimore
Deputy food and drug commissioner:
*R. L. Swain, Ph.D., LL.B.
Bureau of bacteriology:
*C. A. Perry, chief, Baltimore
Bureau of sanitary engineering:
*Abel Wolman, B.S.E., chief, Baltimore
Bureau of chemistry:
*John C. Krantz, Jr., Ph.M., chief, Baltimore
Bureau of child hygiene:
*J. H. Mason Knox, Jr., Ph.D., M.D., chief, Baltimore
Appropriations for fiscal year ending Sept. 30, 1934, $346,332
Publications issued by health department:
Annual report
Weekly News Letter
Monthly bulletin

MASSACHUSETTS

Public health council:
Henry D. Chadwick, M.D., chairman, Boston
Roger I. Lee, M.D., Boston
Francis H. Lally, M.D., Milford
Richard P. Strong, M.D., Boston
Sylvester E. Ryan, M.D., Springfield
James L. Tighe, Holyoke
Gordon Hutchins, Concord
Executive health officer:
*Henry D. Chadwick, M.D., State commissioner of public health, Boston
Secretary:
*Alice M. Nelson
Division of administration:
(Under direction of commissioner)
Division of communicable diseases:
*Gaylord W. Anderson, M.D., director, Boston
Division of sanitary engineering:
*Arthur D. Weston, C.E., director and chief engineer, Boston
Division of water and sewage laboratories:
*Arthur D. Weston, C.E., director, Boston
Division of biologic laboratories:
*Elliott S. Robinson, M.D., director and pathologist, Boston
Divisions of food and drugs:
*Hermann C. Lythgoe, director and analyst, Boston
Division of child hygiene:
*M. Luise Diez, M.D., director, Boston
Division of tuberculosis sanatoria:
*Alton S. Pope, M.D., director, Boston
Division of adult hygiene:
*Herbert L. Lombard, M.D., director, Boston

MASSACHUSETTS—Continued

Appropriations for department of public health, 1933:

Division of administration:	
Salary of commissioner	$6,375.00
Personal services	18,455.00
Services other than personal	11,025.00
Division of child hygiene:	
Personal services of director and assistants	32,900.00
Services other than personal	14,400.00
Personal services in connection with maternal and infant hygiene	21,450.00
Expenses in connection with maternal and infant hygiene	9,200.00
Division of communicable diseases:	
Personal services of director, district health officers, etc	68,760.00
Services other than personal	15,075.00
Personal services in connection with control of venereal diseases	12,870.00
Expenses in connection with control of veneral diseases	28,000.00
Wassermann Laboratory:	
For personal services	15,990.00
For expenses of laboratory	5,000.00
Antitoxin and vaccine laboratory:	
For personal services	66,860.00
Other services	34,500.00
Inspection of food and drugs:	
For personal services	48,725.00
Other services	11,050.00
For administering the shellfish law:	
Personal services	1,860.00
Other services	1,000.00
Water supply and disposal of sewage, engineering division:	
For personal services	66,125.00
For other services	18,450.00
Water supply and disposal of sewage, division of water and sewage laboratories:	
For personal services	40,280.00
For other services	7,200.00
Division of tuberculosis:	
For personal services	33,750.00
Services other than personal	5,350.00
For personal services of tuberculosis clinic units	54,400.00
Services other than personal (clinic units)	31,200.00
Payment of subsidies	405,000.00
For maintenance of and for certain improvements at the Lakeville, North Reading, Rutland, and Westfield State sanatoria	973,036.25
Division of adult hygiene:	
For personal services	41,840.00
For other expenses	33,050.00
Cancer hospital at Norfolk:	
For maintenance of and for certain improvements	227,750.00
Total	2,360,926.00

MICHIGAN

Advisory council of health:

Robert B. Harkness, M.D., Houghton
Chalmers J. Lyons, D.D.Sc., Ann Arbor
Louis J. Hirschman, M.D., Detroit
Karl B. Brucker, M.D., Lansing
George J. Curry, M.D., Flint

Executive health officer:
*C. C. Slemons, M.D., Dr.P.H., State health commissioner, Lansing

Bureau of engineering:
*E. D. Rich, C.E., director
*John M. Hepler, assistant engineer
*Willard F. Shephard, assistant engineer
*Raymond J. Faust, assistant engineer
*Orla E. McGuire, assistant engineer

MICHIGAN—Continued

Bureau of laboratories:
*C. C. Young, Ph.D., Dr.P.H., director
*Wm. E. Bunney, Ph.D., associate director
*Minna Crooks, R.N., bacteriologist
*M. B. Kurtz, D.V.M., serologist
*Pearl Kendrick, bacteriologist, West Michigan division
*Ora Mills, bacteriologist, Houghton branch
*A. B. Haw, clinical pathologist
*Roy W. Pryor, Dr.P.H., immunologist
*Merle M. Woodward, toxicologist
*Don Cummings, assistant director, in charge of property

Bureau of child hygiene and public health nursing:
*Lillian R. Smith, M.D., director
*Goldie Corneliuson, M.D., physician
*Ida M. Alexander, M.D., prenatal consultant
*Helen de Spelder Moore, R.N., assistant director

Bureau of records and statistics:
*W. J. V. Deacon, M.D., director

Bureau of education:
*Marjorie Delavan, director
*Pearl Turner, assistant director
*Melita Hutzel, lecturer

Bureau of embalming:
*Frank J. Pienta, director

Bureau of communicable diseases and rural hygiene:
*C. D. Barrett, M.D., C.P.H., director
*Filip Forsbeck, M.D., associate director, in charge of communicable diseases
*M. B. Beckett, M.D., C.P.H., field agent, in charge of rural hygiene

Bureau of mouth hygiene:
*William R. Davis, D.D.S., director

Appropriations for fiscal year ending June 30, 1934:

Personal services	$200,500
Supplies; Contractual service	97,250
Outlay for equipment	7,700
Total	305,450
County health departments	48,000
Smallpox vaccine, toxoid manufacturing	5,000
Beaver Island, physician	2,200
Grand total	360,650

Publications issued by health department:
Monthly bulletin
Annual report
Communicable disease pamphlets
Sex hygiene pamphlets
Child hygiene pamphlets
Engineering bulletins
Mouth hygiene pamphlets
Scientific reprint series
Rules and regulations

MINNESOTA

Board of health:
N. G. Mortensen, M.D., president, St. Paul
Frederic Bass, C.E., vice president, Minneapolis
Erling S. Platou, M.D., Minneapolis
J. A. Thabes, Sr., M.D., Brainerd
Helen Hughes Hielscher, M.D., Mankato
S. Z. Kerlan, M.D., Aitkin
C. I. Oliver, M.D., Graceville
A. S. Milinowski, C.E., St. Paul
Thomas G. Bell, Duluth

Executive health officer, State Office Bldg., St. Paul:
* A. J. Chesley, M.D., secretary and executive officer

Division of administration, State Office Bldg., St. Paul:
*O. C. Pierson, director

Division of vital statistics, State Office Bldg., St. Paul:
*Gerda C. Pierson, director

Division of hotel inspection, State Office Bldg., St. Paul:
*E. H. Berg, State hotel inspector

MINNESOTA—Continued

Division of preventable diseases (including venereal diseases), University Campus, Minneapolis:
- *O. McDaniel, M.D., director
- *Lucy Heathman, Ph.D., chief of laboratories
- *W. P. Greene, M.D., epidemiologist
- *James E. Perkins, M.D., epidemiologist
- *Ralph R. Sullivan, M.D., epidemiologist

Division of sanitation, University Campus, Minneapolis.
- *H. A. Whittaker, director
- *O. E. Brownell, C.E., senior sanitary engineer

Division of child hygiene, university campus, Minneapolis:
- Everett C. Hartley, M.D., director
- *Olivia Peterson, R.N., superintendent of public-health nursing

Appropriations for fiscal year ending June 30, 1934:

Maintenance and vital statistics —	
Salaries	$27,600
Expenses	7,000
	34,600
Providing free antitoxin and other biological products (balance, $11,801.80)	
Venereal diseases and venereal-disease education	20,600
Sanitary engineering and laboratory	25,000
Preventable diseases and laboratory	65,000
Protection for maternity and infancy	28,000
Indian-health work	8,000
Hotel inspection	33,000
Stream pollution survey	10,000
For aid to typhoid carriers	7,500
For printing	450
Total	232,150

Publications issued by health department:
- Educational pamphlets

MISSISSIPPI

Board of health:
- J. W. Lipscomb, M.D., president, Columbus
- Felix J. Underwood, M.D., secretary, Jackson
- S. E. Eason, M.D., New Albany
- L. B. Austin, M.D., Rosedale
- W. A. Dearman, M.D., Gulfport
- B. J. Shaw, M.D., Slate Spring
- W. H. Frizell, M.D., Brookhaven
- John Darrington, M.D., Yazoo City
- Dudley Stennis, M.D., Newton
- Wm. R. Wright, D.D.S., Jackson

Executive health officer:
- *Felix J. Underwood, M.D., secretary, State board of health, Jackson

Bureau of vital statistics:
- *R. N. Whitfield, M.D., director, Jackson

Bureau of child hygiene and public health nursing:
- *Felix J. Underwood, M.D., acting director, Jackson
- *Mary D. Osborne, R.N., supervisor, public health nursing, Jackson
- *Gladys Eyrich, supervisor oral hygiene, Jackson

Hygienic laboratory:
- *T. W. Kemmerer, M.D., director, Jackson

Bureau of sanitary engineering:
- *H. A. Kroeze, C.E., director, Jackson
- *N. M. Parker, D.V.S., State sanitary inspector, Jackson
- *C. M. Ledbetter, State sanitary inspector, Jackson
- *Floyd Ratliff, State sanitary inspector, Jackson

Bureau of county health work:
- *H. C. Ricks, M.D., C.P.H., director, Jackson
- *John A. Milne, M.D., M.P.H., assistant director, Jackson

Bureau of tuberculosis control:
- *Henry Boswell, M.D., director, Sanatorium

Bureau of industrial hygiene:
- *J. W. Dugger, M.D., director, Jackson

Epidemiological unit:
- *A. L. Gray, M.D., M.P.H., director, Jackson
- *Catharine Mayfield, bacteriologist
- *Margaret Meade, nurse-investigator

MISSISSIPPI—Continued

State appropriation for period January 1 to December 31, 1933, $130,000.

Publications issued by health department:
- Biennial report
- Health pamphlets

MISSOURI

Board of health
- Emmett P. North, M.D., president, St. Louis
- P. T. Bohan, M.D., vice president, Kansas City
- W. T. Elam, M.D., St. Joseph
- W. A. Clark, M.D., Jefferson City
- E. S. Smith, M.D., Kirksville
- T. S. Bourke, M.D., Kansas City
- E. T. McGaugh, M.D., State health commissioner, Jefferson City

Executive health officer:
- *E. T. McGaugh, M.D., State health commissioner, Jefferson City

Epidemology:
- *E. K. Musson, M.D., M.P.H., epidemiologist

Laboratories:
- *Dora Snyder, acting bacteriologist

Sanitary engineering:
- *Herbert Bosch, public health engineer

Vital statistics:
- *William F. Lunsford, M.D., M.P.H., vital statistician

Child hygiene and cooperative county health work:
- *Irl Brown Krause, M.D., director

Public health nursing:
- *Miss Ida Brossard, R.N., supervisor

Appropriations for State board of health, biennial period 1933-34:

Additions	$3,000
Repairs and replacements	6,000
Operation	41,250
Salaries	152,500
Total	202,750
Board of health fund:	
Personal service	15,000
Repairs and replacements	2,625
Operation	12,375
Total	30,000
Cosmetology and hair-dressing:	
Personal service	16,822
Additions	578
Repairs and replacements	572
Operation	12,028
Total	30,000

MONTANA

Board of health:
- George M. Jennings, M.D., president, Missoula
- L. H. Fligman, M.D., Helena
- E. G. Balsam, M.D., Billings
- E. M. Porter, M.D., Great Falls
- B. L. Pampel, M.D., Livingston
- W. F. Cogswell, M.D., secretary

Executive health officer:
- *W. F. Cogswell, M.D., secretary, Helena

Division of communicable diseases:
- *J. H. Crouch, M.D., epidemiologist, Helena

Division of child welfare:
- *W. F. Cogswell, M.D., acting director, Helena

Division of food and drugs:
- *J. W. Forbes, director, Helena

Division of vital statistics:
- *W. F. Cogswell, M.D., State registrar, Helena
- *L. L. Benepe, deputy State registrar, Helena

Division of water and sewage:
- *H. B. Foote, director, Helena
- W. M. Cobleigh, consulting sanitary engineer, Bozeman
- *Oliver Morgan, analyst, Helena

Hygienic laboratory:
- *Fred D. Stimpert, director, Helena
- *Edith Kuhns, technician, Helena
- E. D. Hitchcock, M.D., consulting bacteriologist, Great Falls

MONTANA—Continued

Appropriations for the years ending—

	June 30, 1934	June 30, 1935
Salaries	$23,300	$23,300
Operating expenses	15,750	15,750
Capital repairs and replacements	500	500
Division of child welfare	10,500	10,500
Board of entomology (Rocky Mountain spotted-fever work)	3,000	3,000
Total	53,050	53,050

NEBRASKA

Department of health:
Executive health officer:
*P. H. Bartholomew, M.D., acting director of health, Lincoln
Collaborating epidemiologist:
*P. H. Bartholomew, M.D., Lincoln
Bacteriologist:
*L. O. Vose, Lincoln
Division of venereal diseases:
*P H. Bartholomew, M.D., director, Lincoln
Statistician:
*Jean Barrett, Lincoln
Medical examining board:
W. R. Boyer, M.D., Pawnee City
H. J. Lehnhoff, M.D., Lincoln
P. A. DeOgny, M.D., Milford
Appropriations for biennial period ending June 30, 1935:

Salary of director	$7,200
Salaries	20,000
Maintenance	10,000
Total	37,200

NEVADA

State board of health:
F. B. Balzar, Governor, president, Carson City
Edward E. Hamer, M.D., secretary and State health officer, Carson City
W. G. Greathouse, secretary of State
John Fuller, M D., Reno
C. W. West, M.D , Reno
Executive health officer:
*Edward E. Hamer, M.D., State health officer, Carson City
State hygienic laboratory at State university:
*Vera E. Lautenschlager, acting director, Reno
Appropriations for period from July 1, 1933, to June 30, 1935:

Salary of secretary	$5,000
Salary of clerk	2,813
Traveling expenses	1,500
Office postage	250
Office supplies, heat, rent, and light	1,800
Office telephone and telegraph	300
Equipment	200
Registration of births and deaths	350
Purchase of diphtheria and other dangerous disease antitoxin	500
Total	12,713

Publications issued by health department:
Biennial report
Special bulletins

NEW HAMPSHIRE

Board of health:
Robert Fletcher, C.E., president, Hanover
D. E. Sullivan, M.D., Concord
George C. Wilkins, M.D., Manchester
Barbara Beattie, M.D., Littleton
John G. Winant, Governor
Francis W. Johnston, attorney general, Claremont

NEW HAMPSHIRE—Continued

Executive health officer:
*Charles Duncan, M.D., secretary, State board of health, Concord
*Harriet I. Parkhurst, chief clerk, Concord
Division of maternity, infancy, and child hygiene:
*Mary D. Davis, R.N., director and supervising nurse, Manchester
Department of vital statistics:
*Charles Duncan, M.D., registrar, Concord
*Doris P. Bartlett, chief clerk, Concord
Division of chemistry and sanitation:
*Charles D. Howard, chief of division, Concord
*Frederick Vintinner, assistant chemist, Concord
*Harriet I Albee, assistant chemist and bacteriologist, Concord
*Leonard W. Trager, assistant sanitary engineer, Concord
*Russell A. Eckloff, inspector
*Joseph X. Duval, chief inspector, Concord
Diagnostic and pathological department:
*William R. Macleod, serologist and diagnostic bacteriologist, Concord
H. N. Kingsford, M.D., pathologist, Hanover
*Benj. Jewell, assistant in pathological laboratory, Concord
Venereal disease division:
*Charles A. Weaver, M.D., Manchester
Appropriations for fiscal year ending June 30, 1934:

State board of health	$49,503
Laboratory of hygiene	17,490
Vital statistics	3,340
Cancer clinic fund	15,000
Total	85,333

Publications issued by health department:
Bulletin
Biennial report

NEW JERSEY

Board of health:
Charles I. Lafferty, president, Atlantic City
Margaret L. MacNaughton, vice president, Jersey City
Mrs. Helen M. Berry, Newark
H. E. Winter, V.M.D., Plainfield
J. Oliver McDonald, M.D., Trenton
S. A. Cosgrove, M D., Jersey City
J. E. H. Guthrie, D.D.S , Newark
Clyde Potts, C.E , Morristown
Irvin E. Deibert, M.D., Camden
James E. Russell
John V. Bishop
Executive health officer:
*J. Lynn Mahaffey, M.D., director of health, Trenton
Bureau of bacteriology:
*John V. Mulcahy, chief, Trenton
Bureau of chemistry:
*John E. Bacon, chief, Trenton
Bureau of administration:
*Charles J. Merrell, chief, Trenton
Bureau of food and drugs:
*Walter W. Scofield, chief, Trenton
Bureau of public-health education:
*Edwin C. Lanigan, chief, Trenton
Bureau of child hygiene:
Julius Levy, M.D., consultant, Trenton
Bureau of local health administration:
Wm. H. McDonald, acting chief, Trenton
Bureau of engineering:
*H. P. Croft, chief, Trenton
Bureau of vital statistics:
*David S. South, chief, Trenton
Bureau of venereal-disease control:
A. J. Casselman, M.D., consultant, Trenton
Appropriations for fiscal year ending June 30, 1934:

Salaries	$223,600.00
Miscellaneous	58,500.00
Child hygiene	103,872.52
Venereal disease control	25,420.00
Total	411,392.52

Publications issued by health department:
Monthly bulletin
Annual report

NEW MEXICO

Board of public welfare:
Robert O. Brown, M.D., president, Santa Fe
Max Nordhaus, Albuquerque
Mrs. David Chavez, Jr., secretary, Santa Fe
Mrs. Orren Beaty, Lovington
Eugene D. Lujan, Albuquerque
Executive health officer.
*J. Rosslyn Earp, Dr.P.H., director of public health, Santa Fe
Division of sanitary engineering and sanitation:
*Paul S. Fox, M.S. in C.E., chief, Santa Fe
Division of county health work:
*C. H. Douthirt, M.D., director, Santa Fe
State supervisor of public-health nursing:
*Eleanor L. Kennedy, R.N., Santa Fe
Public-health laboratory:
*Myrtle Greenfield, chief, Albuquerque
State registrar:
*Miss Billy Tober, Santa Fe
Appropriation for years 1933-34 and 1934-35, per annum, $35,900. Fiscal year ends June 30.

NEW YORK

Public health council:
Simon Flexner, M.D., LL.D., chairman, New York
Homer Folks, LL.D., vice chairman, Yonkers
Henry N. Ogden, C.E., Ithaca
Frederick F. Russell, M.D., New York
Livingston Farrand, M.D., Ithaca
Walter A. Leonard, M.D., Cambridge
Thomas Parran, Jr., M.D. (ex officio), commissioner of health, Albany
Executive health officer:
*Thomas Parran, Jr., M.D., State commissioner of health, Albany
Deputy commissioner of health:
*Paul B. Brooks, M.D., Albany
*Edward S. Godfrey, M.D., assistant commissioner for local health administration
Administrative officer:
*Edmund Schreiner, LL.B.
Division of public-health education:
*B. R. Rickards, director, Albany
Division of sanitation:
*Charles A. Holmquist, C.E., director, Albany
Division of vital statistics:
*Joseph V. De Porte, Ph.D., director, Albany
Division of maternity, infancy, and child hygiene:
*Elizabeth M. Gardiner, M.D., director, Albany
Division of communicable diseases:
*George H. Ramsey, M.D., director, Albany
Division of tuberculosis:
*Robert E. Plunkett, M.D., director, Albany
Division of social hygiene:
*Albert Pfeiffer, M.D., director, Albany
Division of laboratories and research:
*Augustus B. Wadsworth, M.D., director, Albany
Division of public-health nursing:
*Marion Sheahan, R.N., director, Albany
Division of orthopedics:
*Walter J. Craig, M.D., director, Albany
Division of cancer control:
*Burton T. Simpson, M.D., director
Institute for the study of malignant disease, Buffalo:
*Burton T. Simpson, M.D., director
New York State Hospital for Incipient Pulmonary Tuberculosis, Ray Brook:
*H. A. Bray, M.D., superintendent
New York State Reconstruction Home, West Haverstraw:
*John B. Kelly, superintendent
Appropriations for fiscal year ending June 30, 1934:

Personal service	$1,671,460.00
Maintenance and operation	770,129.00
State aid to county laboratories	110,000.00
State aid to county health activities	442,211.24
Emergency poliomyelitis fund	25,000.00
Construction and permanent betterments	1,853,700.00
Total	4,872,500.24

NEW YORK—Continued

Other sources of revenue:
Fees from certified transcripts of birth, death, and marriage certificates, $2,737.05 per annum
Licensing laboratories, $419
Sale of serums, $1,921.57
Licensing of embalmers and undertakers, $5,521.50
Registration of embalmers and undertakers, $27,508.50
Rental of radium, estimated, $920.
Care of county cases at reconstruction house, $104,437.88
Refund of transportation of discharged patients from tuberculosis hospital, Ray Brook, estimated, $4,000
Publications issued by health department:
Weekly Health News
Monthly Vital Statistics Review
Annual report

NORTH CAROLINA

Board of health:
Carl V. Reynolds, M.D., president, Asheville
S. D. Craig, M.D., vice president, Winston-Salem
G. G. Dixon, M.D., Ayden
J. N. Johnson, D.D.S., Goldsboro
H. Lee Large, M.D., Rocky Mount
H. G. Baity, Chapel Hill
W. T. Rainey, M.D., Fayetteville
Hubert B. Haywood, M.D., Raleigh
James P. Stowe, Ph G., Charlotte
Executive health officer:
*James M. Parrott, M.D., secretary and State health officer, Raleigh
Division of laboratories and vital statistics:
*John H. Hamilton, M.D., director, Raleigh
*R. T. Stimpson, M.D., bureau of vital statistics, Raleigh
Division of sanitary engineering:
*Warren H. Booker, C.E., director, Raleigh
Division of preventive medicine:
*G. M. Cooper, M.D., director, Raleigh
(a) Maternity and infancy
(b) Health education
Division of county health work:
M. V. Ziegler, M.D., director, pro tem, Raleigh
Bureau of epidemiology:
J. C. Knox, M.D., director, Raleigh
Division of oral hygiene:
*Ernest A. Branch, D.D.S., director, Raleigh
Appropriation for fiscal year ending June 30, 1933, $215,275.
Other sources of revenue: Special fees, $66,512.

NORTH DAKOTA

Advisory health council:
John Crawford, M.D., New Rockford
Agnes Stucke, M.D., Garrison
C. W. Livingston, D.D.S., Minot
P. O. Sather, attorney general, ex officio, Bismarck
Arthur E. Thompson, superintendent of public instruction, ex officio, Bismarck
Maysil M. Williams, M.D., C.P.H., State health officer
Executive health officer:
*Maysil M. Williams, M.D., C.P.H., State health officer, Bismarck
Bureau of child hygiene and public-health nursing:

Bureau of venereal diseases:
(No appropriation)
Bureau of sanitary engineering:
(No appropriation)
Bureau of vital statistics:
(No appropriation)

NORTH DAKOTA—Continued

Appropriations for biennial period ending June 30, 1935:

Salary State health officer	$4,800
Director of preventable diseases	2,000
Bureau of child hygiene and public health nursing	6,113
Director of division of child hygiene	3,584
Three stenographers	2,400
One nurse	2,529
Postage	700
Office supplies	300
Printing and lithographing	500
Miscellaneous	250
Travel expense	1,500
Tabulating, indexing, filing, and binding birth, death, and marriage certificates	1,000

OHIO

Public-health council:
- H S. Southard, M.D., chairman, Columbus
- James E. Bauman, secretary
- G. D. Lummis, M.D.
- R. M. Calfee
- W. I. Jones, D.D.S.
- (Vacancy)

Executive health officer:
- *H. S. Southard, M.D., director of health, Columbus

Assistant director of health:
- *James E. Bauman

Division of administration:
- *James E. Bauman, chief
- *C. A. Orrison, chief clerk
- Bureau of publicity:
  - *Paul Mason, director
- Bureau of local health organization:
  - *R. W. DeCrow, M.D., chief

Division of communicable diseases:
- *Finley Van Orsdall, M.D., chief
- Bureau of tuberculosis:
  - *W. J. Smith, M.D.
- Bureau of venereal diseases:
  - *W. P. Johnson, M.D.
- Bureau of prevention of blindness:
  - *W. P. Johnson, M.D.

Division of sanitary engineering:
- *F. H. Waring, chief
- Bureau of plumbing inspection:
  - *George Wood, acting chief

Division of vital statistics:
- *Irva C. Plummer, chief

Division of laboratories:
- *Leo F. Ey, chief

Division of hygiene:
- *E. R. Hayhurst, M D., chief
- Bureau of hospitals:
  - *Clara E. Reeder, R N., chief
- Bureau of dental hygiene:
- Bureau of child hygiene:
- Bureau of occupational diseases:

Appropriations for 12 months ending Dec. 31, 1933 and 1934:

	1933	1934
Personal services	$178,495.73	$178,495.73
Maintenance	53,087.60	53,087.60
State aid for health districts	150,000.00	150,000.00
Total	381,583.33	381,583.33

Publications issued by health department:
- Ohio Health News (semimonthly)

OKLAHOMA

Executive health officer:
- *G. N. Bilby, M.D., State health commissioner, Oklahoma City

OKLAHOMA—Continued

Assistant State health commissioner:
- *J P. Folan, Oklahoma City

Bureau of vital statistics.
- *Juanita Johnston Smith, registrar

Bureau of laboratories:
- *Katherine Harris, bacteriologist
- *Hannah Wallock, assistant bacteriologist
- *Taylor Rogers, chemist

Bureau of sanitary engineering:
- *H. J. Darcey, B.S in Engineering, director

Appropriations for fiscal years ending June 30, 1934 and 1935

Administration:	
Commissioner	$3,840
Assistant commissioner	2,100
Secretary and stenographer	1,320
Bookkeeper	1,500
Bureau of diagnostic laboratory:	
Chemist	2,400
Assistant chemist	1,500
Bacteriologist	1,800
Assistant bacteriologist	1,800
Record clerk	1,200
Extra help—janitor	900
Manufacture typhoid and toxoid-vaccine	2,500
Bureau of sanitary engineering:	
Engineer	2,800
Bureau of pure food, drugs, and sanitary inspection:	
Inspectors (4 at $1,500 each)	6,000
Bureau of vital statistics:	
Registrar	2,000
Assistant registrar	1,200
Statistical clerks (2 at $1,200)	2,400
Travel, administration	6,000
Communication	3,500
Printing, administration	2,500
Office supplies	500
Medical supplies	7,000
Office equipment	250
Laboratory equipment	900
Bureau of epidemiology, Bureau of rural sanitation and disease control in the rural districts, and dental health education	17,500
Malaria control	7,500
Registrars of vital statistics	20,000
Total	100,910

OREGON

Board of health:
- N. E. Irvine, M.D., president, Lebanon
- Albert Mount, M.D., vice president, Oregon City
- Robert L. Benson, M.D., Portland
- J. P. Brennan, M.D., Pendleton
- H. H. Foskett, M.D., Portland
- J. H. Rosenberg, M.D., Prineville
- J. H. Rossman, D.M.D., Portland

Executive health officer:
- *Frederick D. Stricker, M.D., secretary and State health officer, Portland

Registrar of vital statistics:
- *Frederick D. Stricker, M.D., Portland

Division of public health nursing and child hygiene:
- *Mary P. Billmeyer, R. N., Portland

Director of laboratory:
- *William Levin, D.P.H., Portland

Appropriations for fiscal year ending December 31, 1933, $28,864.50.

Publications issued by health department:
- Annual report
- Biennial report
- Pamphlets and posters
- Weekly letter

PENNSYLVANIA

Advisory health board:
- Theodore B. Appel, M.D., chairman
- Ross V. Patterson, M.D., Philadelphia
- William G. Turnbull, M.D., Philadelphia
- John M. Bock, M.D., Alexandria
- C. B. Auel, M.E., Pittsburgh
- Saylor T. McGhee, M.D., Lock Haven
- W. L. Eicher, Oakmont

PENNSYLVANIA—Continued

- Sanitary water board:
  - Theodore B. Appel, M. D., chairman
  - Lewis E. Staley, secretary of forests and waters, Harrisburg
  - O. M. Deibler, commissioner of fisheries, Harrisburg
  - P. T. Davis, Clearfield
  - Elmer A. Holbrook, Pittsburgh
  - W. C. McCormick, Williamsport
  - W. L. Stevenson, chief engineer and secretary, Harrisburg
  - Edmund C. Wingerd, Chambersburg
- Executive bureau:
  - *Theodore B. Appel, M. D., secretary of health, Lancaster
  - *J. Bruce McCreary, M. D., deputy secretary of health, Shippensburg
  - *Clifton T. Williams, comptroller, Harrisburg
- Division of accounts:
  - *E. J. McNamara, Philadelphia
- Division of supplies:
  - *Roy G. Miller, Harrisburg
- Division of laboratories:
  - *John L. Laird, M.D., Philadelphia
- Institutions:
  - Mont Alto sanatorium:
    - *R. H. McCutcheon, M. D., medical director, South Mountain
  - Cresson sanatorium:
    - *T. H. A. Stites, M.D., medical director, Cresson
  - Hamburg sanatorium:
    - *H. A. Gorman, M. D., medical director, Hamburg
  - State hospital for crippled children:
    - *Francis S. Chambers, M.D., medical director, Elizabethtown
    - *L. G. Ownes, business manager, Elizabethtown
- Bureau of health law enforcement:
  - *J. Bruce McCreary, M. D.
- Division of school inspection:
  - *Charles W. Sheldon, M.D., county medical director, Wellsboro
  - *John W. German, Harrisburg
- Pre-school division:
  - *Mary Riggs Noble, M.D., Harrisburg
- Division of public health education:
  - *J. C. Funk, LL.B., Harrisburg
- Division of drug control:
  - *Harold V. Smith, Curwensville
- Division of restaurant hygiene:
  - *Howard M. Haines, Harrisburg
- Bureau of health conservation:
  - *J. Moore Campbell, M.D., Harrisburg
- Division of tuberculosis clinics:
  - *John B. Critchfield, M.D., Lock Haven
- Division of environmental hygiene:
  - *Howard F. Bronson, Harrisburg
- Division of genito-urinary diseases:
  - *Edgar S. Everhart, M.D., Lemoyne
- Division of epidemiology:
  - *S. J. Dickey, M. D., Harrisburg
- Bureau of nursing:
  - *Mrs. Mary S. Evans, R.N., Harrisburg
- Bureau of milk control:
  - *Robert F. Brinton, West Chester
- Bureau of sanitary engineering:
  - *W. L. Stevenson, Harrisburg
- Bureau of vital statistics:
  - *Emlyn Jones, M.D., Johnstown
- Appropriations for biennial period ending May 31, 1935:

Salary of secretary	$20,000
General health purposes and maintenance of sanatoria and hospital for crippled children	5,123,000
Orthopedic unit	50,000
Salinity survey of Delaware River	25,000
Total	5,218,000

PHILIPPINE ISLANDS

- Director of health:
  - *Jacobo Fajardo, M.D., Manila
- Assistant to the director:
  - Regino G. Padua, M.D., D.T.M., Dr.P.H.
- Council of hygiene, advisory board to the director of health:
  - Benito Valdes, M.D., chairman
  - Gervasio de Ocampo, M.D.
  - Jose Albert, M.D.
  - Proceso Gabriel, M. D.
  - Hilario Lara, M.D., Dr.P.H.
  - Eulogio P. Revilla, LL.B.
  - Vicente P. Genato
  - Jose P. Bantug, Ph.G., M.D., secretary
- Executive health officer:
  - *Jacobo Fajardo, M.D., director of health, Manila
- Division of administration:
  - *Leoncio Lopez-Rizal, M.D., chief
  - *Geronimo Mercado, P. A., chief clerk
  - Personnel section:
    - *Jose Villacorta, chief
  - Records section:
    - *Victorio Yabot, chief
  - Finance section:
    - *Lope O. Tayao, chief
  - Property section:
    - *Bonifacio Mencias, M.D., chief
  - Publicity section:
    - *Jose P. Bantug, Ph.G., M.D., chief
  - Nursing section:
    - *Genera S. Manongdo, R.N., chief
  - Nutrition section:
    - Froilan Eubanas, M.D., C.P.H., in charge
- Division of hospitals and dispensaries:
  - *Eusebio D. Aguilar, M.D., chief
  - Baguio hospital:
    - *Teodoro C. Arvisu, M.D., chief
  - Culion Leper Colony:
    - *Jose M. Raymundo, M.D., C.P.H., chief
    - *Casimiro B. Lara, M.D., chief physician
  - Insular Psychopathic Hospital:
    - Elias Domingo, M.D., chief alienist
  - San Lazaro Hospital:
    - Catalino Gavino, M.D., chief
  - Southern Islands Hospital:
    - Augusto P. Villalon, M.D., chief
- Division of maternal and child hygiene:
  - *Tranquilino Elicaño, M.D., chief
  - Section of school health supervision:
    - Mariano C. Icasiano, M.D., C.P.H., chief
  - Section of puericulture center clinics:
    - Demetrio Belmonte, M.D., chief
  - Section of maternity hospitals:
    - *Fe S. Horilleno, M.D., chief
  - Section of midwifery instruction:
    - Eusebio Salud, M.D., chief
- Division of epidemiology:
  - *Eugenio Hernando, M.D., C.P.H., chief
  - Section of vital statistics:
    - *Jose Guidote, M.D., C.P.H., chief
  - Section of tuberculosis control:
    - *Sixto A. Francisco, M.D., chief
  - Section of leprosy:
    - *Sulpicio Chiyuto, M.D., chief
    - *Cristobal Manalang, M.D., D.T.M., chief pathologist
    - *Jose Rodriguez, M.D., C.P.H., general supervisor of regional leprosy treatment stations
  - Section of malaria control:
    - Antonio Ejercito, M.D., chief
  - Section of control of other preventable diseases:
    - Angel Alonzo, M.D., C.P.H., chief
- Division of sanitation:
  - *Gabriel Intengan, M.D., chief
  - Section of urban sanitation:
    - *Felipe Arenas, M.D., C.P.H., chief
  - Section of rural sanitation:
    - *Enrique F. Ochoa, M.D., C.P.H., chief
  - Section of sanitary engineering:
    - Manuel Mañosa, C.E., chief
  - Section of immunization:
    - *Jose Sian, M.D., C.P.H., chief

PHILIPPINE ISLANDS—Continued

Appropriation for fiscal year ending December 31, 1933:

Salaries and wages	$517, 288. 45
Miscellaneous expenses	490, 100. 84
Furniture and equipment	6, 412. 50
Total	1, 013, 801. 79

Special expenses:

For tuberculosis control work, act 3743	48, 390. 00
Continuation of treatment and diagnosis of lepers	96, 132. 50
Maintenance of regional treatment stations, etc	62, 224. 50
Aid to specially organized Provinces	180, 193. 50
Aid to Prvoince of Ilocos Sur for the operation, maintenance, and equipment of the Cervantes Hospital	6, 000. 00
School of nursing in Baguio	4, 677. 50
Medicines and medical and surigcal supplies for distribution to public-school dispensaries	3, 350. 00
General demonstration on a small scale of the practical control of beriberi	4, 688. 00
Control of malaria in the regularly specially organized Provinces and municipal districts	17, 778. 00
For insular aid for operation and maintenance of provincial hospitals	86, 008. 00
For the support of the Philippine Islands Antituberculosis Society	25, 000. 00
For the operation of the maternity hospital, including the training of midwives in the city of Manlia	25, 000. 00
Aid to puericulture centers	42, 507. 00
Total for special expenses	601, 949. 00
Less required savings in any item of salaries and wages, miscellaneous expenses, furniture and equipment, and special expenses	124, 177. 50
Grand total of appropriation	1, 491, 573. 29

Publications issued by the bureau of health:
- Daily Service News
- Weekly comparative epidemiological résumé
- Weekly résumé of births and deaths
- Monthly bulletin
- Health Messenger (monthly)
- Annual report
- Service numbered pamphlets
- Reprints (unnumbered pamphlets)
- Posters

PUERTO RICO

Insular board of health:
- R. López Sicardó, M.D., chairman, San Juan
- W. A. Glines, M.D., San Juan
- E. Koppisch, M.D., San Juan
- Blas C. Herrero, M.D.
- H. Cook, expert chemist
- (Vacancy)
- A. Rivera, veterinarian
- Manuel del Valle, M.D.
- A. Ortiz Toro, attorney, San Juan
- Luis B. de la Vega, M.D., secretary

Executive health officer:
- *E. Garrido Morales, M.D., Dr., P. H. commissioner of health, San Juan.
- *Antonio Arbona, M.D., assistant commissioner of health, section of public health, San Juan
- *Pedro Malaret, M.D., assistant commissioner of heatlh, section of charities, San Juan

PUERTO RICO—Continued

Division of property and accounts:
- *Abelardo Santiago, chief, San Juan

Bureau of general sanitation:
- *W. F. Lippitt, M.D., chief, San Juan

Bureau of sanitary engineering:
- *Octavio Marcano, sanitary engineer, San Juan

Biological laboratory:
- *Oscar Costa Mandry, M.D., director, San Juan

Chemical laboratory:
- *R. del Valle Sárraga, Ph.C., director, San Juan

Bureau of transmissible diseases:
- *Abel de Juan, M.D., chief, San Juan

Bureau of vital statistics:
- *Manuel A. Perez, chief, San Juan

Bureau of tuberculosis:
- *J. Rodriguez Pastor, M.D., chief, San Juan.

Bureau of malaria:
- *Walter C. Earle, M.D., chief, San Juan

Bureau of infant hygiene:
- *Marta Robert de Romeu, M.D., chief, San Juan

Bureau of public-health units:
- *George C. Payne, M.D., chief, San Juan

Division of social service:
- *Beatriz Lassalle, superintendent, San Juan

Appropriations for the fiscal year 1933–34:

Office of the commissioner	$458, 585. 42
Bureau of general sanitation	88, 255. 00
Bureau of sanitary engineering	17, 340. 00
Biological laboratory	31, 096. 00
Chemical laboratory	14, 686. 00
Brueau of transmissible diseases	59, 510. 00
Bureau of vital statistics	11, 765. 00
Bureau of tuberculosis	164, 763. 88
Bureau of malaria	40, 030. 00
Bureau of infant hygiene	8, 612. 22
Bureau of public-health units	228, 377. 58
Division of social service	3, 300. 00
Total	1, 126, 321. 10

RHODE ISLAND

Public health commission:
- John Champlin, Jr., M.D., chairman, Westerly
- Berton W. Storrs, M.D., Portsmouth
- James H. Prior, M.D., Providence
- Dennett L. Richardson, Providence
- Charles H. Holt, M.D., Pawtucket

Executive health officer:
- *Lester A. Round, Ph.D., director of public health and State registrar, State Office Bldg., Providence

Pathologist:
- Lester A. Round, Ph.D., Providence

Chemist:
- Charles L. Poole, Providence

Appropriations for the fiscal year ending June 30, 1934:

Executive department	$48, 420
Chemical department	15, 930
Pathological department	31, 963
Child hygiene	24, 065
Veneral diseases	8, 495

SOUTH CAROLINA

Executive committee, board of health:
- William Egleston, M.D., chairman, Hartsville
- Robert Wilson, Jr., M.D., Charleston
- L. D. Boone, M.D., Aiken
- D. Lesesne Smith, M.D., Spartanburg
- E. A. Hines, M.D., Seneca
- W. R. Wallace, M.D., Chester
- J. Lee Carpenter, Ph.G., Greenville
- F. M. Routh, M.D., Columbia
- George Dick, D.D.S., Sumter
- John M. Daniel, attorney general, Columbia
- A. J. Beattie, comptroller general, Columbia

Executive health officer:
- *James A. Hayne, M.D., State health officer, Columbia

SOUTH CAROLINA—Continued

Department of county health units:
*Ben F. Wyman, M.D., director, Columbia
Laboratory department:
*H. M. Smith, M.D., in charge, Columbia
*J. R. Cain, chief bacteriologist, Columbia
Bureau of vital statistics:
*Miss Nellie Cunningham, chief clerk, Columbia
Bacteriologist and chemist:
F. L. Parker, Jr., M.D., Ph.D., Charleston
South Carolina Sanitorium:
*Ernest Cooper, M.D., superintendent, State Park
Epidemiologist:
*A. H. Hayden, M.D., Columbia
Appropriations for 18 months ending June 30, 1934:

Administrative office	$52,096
Control of epidemic diseases	2,186
For 1 midwife supervisor	2,168
Bureau of vital statistics	9,384
Laboratory	12,352
Bureau of rural sanitation	33,643
Division of sanitary engineering, for 2 inspectors and expenses	5,752
Aid for crippled children	13,500
	131,081
Tuberculosis sanatoria	156,000

Publications issued by health department:
Annual report
Bulletins of various departments

SOUTH DAKOTA

Board of health:
Carl A. Feige, M.D., president, Canova
R. J. Quinn, M.D., vice president, Burke
H. J. Barton, M.D., Watertown
N. T. Owen, M.D., Rapid City
Park B. Jenkins, M.D., superintendent, Pierre
Executive health officer:
*Park B. Jenkins, M.D., Pierre
Division of vital statistics:
*Park B. Jenkins, M.D., Pierre
Division of child hygiene:
*Florence Walker Englesby, R.N., Pierre
Division of sanitary engineering:
*W. W. Towne, C.E., Pierre
Division of medical licensure:
*Park B. Jenkins, M.D., Pierre
Division of records and accounts:
*Katherine Niebuhr, Pierre
Laboratories (at Vermillion):
J. C. Ohlmacher, M.D., Vermillion
Appropriations:

	1933-34	1934-35
Salaries and wages	$10,000	$10,000
Biological products	2,000	2,000
Postage, communication, and travel	3,000	3,000
Crippled children	2,500	2,500
Dues	50	50
Infancy and maternity work	5,000	5,000
Office supplies, printing and binding	2,500	2,500
Total	25,050	25,050

TENNESSEE

Department of public health:
Central administration:
*E. L. Bishop, M.D., C.P.H., commissioner, Nashville
County and other local health work:
*W. K. Sharp, Jr., M.D., director, Nashville
Child hygiene and public health nursing:
Miss Donna Pearce, associate director, public health nursing, Nashville

TENNESSEE—Continued

Department of public health—Continued.
Central administration—Continued.
Division of vital statistics:
*R. H. White, Ph.D., director, Nashville
Division of preventable diseases:
*J. A. Crabtree, M.D., C.P.H., director, Nashville
Division of laboratories:
*William Litterer, M.D., director, Nashville
Division of sanitary engineering:
*Roy J. Morton, C.E., director, Nashville
State appropriation for biennium July 1, 1933, to June 30, 1935, $350,885.
Balance from old appropriation, supplementary, approximately, $90,000.
Other sources of revenue:

Rockefeller Foundation, International Health Division	$38,540
Commonwealth fund	36,504
National Tuberculosis Association (balance from last year)	764
U.S. Public Health Service (trachoma only) (no budget adopted for present fiscal year)	4,230

TEXAS

State board of health:
C. M. Rosser, M.D., Chairman, Dallas
J. M. Howe, C.E., vice chairman, Houston
E. W. Wright, M.D., Bowie
J. S. Wooten, M.D., Austin
J. M. Frazier, M.D., Belton
J. B. Brady, D.D.S., El Paso
S. A. Woodward, M.D., Fort Worth
J. S. McCelvey, M.D., Temple
Henry Hein, Ph.G., San Antonio
Executive health officer:
*John W. Brown, M.D., State health officer, Austin
Bureau of child hygiene:
*H. N. Barnett, M.D., director
Bureau of vital statistics:
*W. A. Davis, M.D., director
Bureau of laboratories:
*S. W. Bohls, M.D., director
Bureau of rural and county health work:
*K. E. Miller, M.D., U.S.P.H.S., director
Bureau of communicable disease control and epidemiology:
*Chas. D. Reese, M.D., director
Bureau of sanitary engineering:
*V. M. Ehlers, C.E., director
Bureau of foods and drugs:
*E. C. Koerth, Ph.G., director
Bureau of public health education:
*L. E. Bracy, director
Appropriations for fiscal years 1934-35, per annum, $189,380.

UTAH

Board of health:
Joseph R. Morrell, M.D., president, Ogden
T. B. Beatty, M.D., secretary, Salt Lake City
Joseph H. Peck, M.D., Tooele
T. J. Howells, M.D., Salt Lake City
W. D. Donoher, M.D., Salt Lake City
R. A. Hart, C.E., Salt Lake City
Barnet E. Bonar, M.D., Salt Lake City
Executive health officer:
*T. B. Beatty, M.D., State health commissioner, Salt Lake City
Bureau of vital statistics:
*T. B. Beatty, M.D., State registrar
Bureau of child hygiene:
*T. B. Beatty, director
Sanitary engineer:
*Lynn Thatcher
Bacteriological laboratory:
*E. H. Bramhall, bacteriologist
Appropriations for 2 years ending June 30, 1935, $40,000.
Publications issued by health department:
Quarterly bulletin
Biennial report

VERMONT

Board of health:
William G. Ricker, M.D., chairman, St. Johnsbury
Claude M. Campbell, M.D., Manchester
Charles G. Abell, M.D., Enosburg Falls
Executive health officer:
*Charles F. Dalton, M.D., secretary, State board of health, Burlington
Laboratory of hygiene:
*Charles F. Whitney, M D., Burlington
Sanitary engineering:
Earle L. Waterman, C.E., director, Burlington
Sanitary inspector:
*Fred S. Kent, M D , Burlington
Division of communicable diseases:
*Fred S. Kent, M D , Burlington
Division of tuberculosis
*H. W. Slocum, Burlington
Division of poliomyelitis:
*Lillian E. Kron, R.N., Burlington
Division of maternity and infancy:
*Nellie M. Jones, R.N.
Appropriations for fiscal year ending June 30, 1934, $44,000; 1935, $52,000.
Other sources of revenue:
Private donations for study and treatment of infantile paralysis.
Publications issued by health department:
Biennial report

VIRGIN ISLANDS

Executive health officer:
*R. B. Stafford, M.D., commissioner of public health, St. Thomas

VIRGINIA

Board of health:
W. T. Graham, M.D., president, Richmond
Mrs. Franklin H. Kenworthy, Purcellville
Frank Darling, Hampton
J. A. McGuire, M.D., Norton
George B. Lawson, M.D., Roanoke
Guy R. Harrison, D.D.S., Richmond
L. T. Royster, M.D., University
Executive health officer:
*W. F. Draper, M.D., Richmond
Assistant health officer:
*Roy K. Flannagan, M.D., Richmond
Director of county health work and tuberculosis out-patient service:
*I. C. Riggin, M.D., Richmond
Epidemiologist:
*G. F. McGinnes, M.D., Richmond
Director of child health:
*B. B. Bagby, M.D., Richmond
Registrar of vital statistics:
*W. A. Plecker, M.D., Richmond
Director of public-health nursing:
*Mary I. Mastin, R.N., Richmond
Director of mouth hygiene:
*N. T. Ballou, D D.S., Richmond
Bacteriologist:
*Adah Corpening, Richmond
Chief sanitary engineer:
*Richard Messer, C.E., Richmond
Appropriations (subject to 30 percent reduction) for the fiscal year ending June 30, 1934:

Administration	$23,805
Sanitary engineering	21,500
Publicity	10,620
Town sanitation	4,500
Social hygiene	2,395
Prevention of tuberculosis	61,450
Control of epidemics	9,525
Laboratories	21,005
Promotion of child health	53,230
Rural health work	98,540
Shellfish inspection—sanitation	25,000
Vital statistics	26,575
Orthopedic treatment	25,000
Collection and publication of marriage and divorce statistics	3,770
Prevention of blindness	2,300
Tuberculosis sanatoria	345,495
Total	734,710

Publications issued by health department:
Monthly bulletin
Annual report

WASHINGTON

Board of health:
E. R. Coffey, M.D., director of health, chairman, Seattle
Ralph Hendricks, M D., Spokane
Alexander Peacock, M.D., Seattle
H. E. Wight, D D.S., Yakima
E. N. Hutchinson, D V.M., Olympia
Department of health:
*E. R. Coffey, M.D., director, Seattle
Division of laboratories and epidemiology:
*A. U. Simpson, M.D., epidemiologist, Seattle
Division of public-health engineering:
*Roy M. Harris, Seattle
Division of public-health nursing and child hygiene:
*Mrs. Mary Louise Allen, R.N., Seattle
Division of vital statistics:
*Francis D. Rhoads, State registrar, Seattle
Appropriation for 2 years ending March 31, 1935:

Salaries	$48,787
Operation	29,250
State aid to local tuberculosis sanatoria	350,000

WEST VIRGINIA

Public health council:
A. H. Hoge, M.D., Bluefield
S. W. Price, M.D., Scarbro
W. C. D. McCuskey, M D., Wheeling
W. E. Vest, M.D., Huntington
B. W. Swint, M.D., Charleston
M. T. Morrison, M.D., Sutton
W. E. Minghini, D.D.S., Martinsburg
Arthur E. McClue, M.D., commissioner of health, Charleston
Executive health officer:
*Arthur E. McClue, M.D., commissioner of health, Charleston
Division of sanitary engineering:
*Ellis S. Tisdale, chief engineer, Charleston
*John B. Harrington, B.E., assistant engineer, Charleston
*H. K. Gidley, assistant engineer, Charleston
*S. C. Rothman, assistant engineer, Charleston
Division of vital statistics:
*Carl F. Raver, M.D., M.P.H., director, Charleston
Division of child hygiene:
*A. M. Price, M.D., acting director, Charleston
State advisory nurse:
*Mrs. Mary Keith Cauthorne, R.N., Charleston
Division of preventable diseases:
*Arthur E. McClue, M.D., acting director, Charleston
Bureau of venereal diseases:
*Mrs. Ada C. McDermott, associate director, Charleston
Division of rural sanitation:
*A. M. Price, M.D., director, Charleston
Hygienic laboratory:
*Elizabeth I. Parsons, director, Charleston
*Margaret K. Riffe, technician, Charleston
*J. Roy Monroe, technician, Charleston
*Mark C. Harp, technician, Charleston
Bureau of public health education:
*Dorothea Campbell, director, Charleston
Appropriation for fiscal year ending June 30, 1934:

For general use	$100,000
Fees (if collected)	7,500
Salary of commissioner	3,600
Total	111,100

Other sources of revenue:
Expenses of cooperative rural-health work with the Rockefeller Foundation
Publications issued:
Annual report
Quarterly bulletin

WISCONSIN

Board of health:
G. Windesheim, M.D., president, Kenosha
Joseph Dean, M.D., vice president, Madison
J. J. Seelman, M.D., Milwaukee
Mina B. Glasier, M.D., Bloomington
Stephen Cahana, M.D., Milwaukee
H. H. Ainsworth, M.D., Birchwood
C. A. Harper, M.D., State health officer, Madison

WISCONSIN—Continued

Executive health officer:
*C. A. Harper, M.D., State health officer, Madison
Assistant State health officer:
*G. W. Henika, M.D., Madison
Deputy State health officers:
*W. J. Miller, M.D., Madison
*G. E. Hoyt, M.D., Milwaukee
*V. A. Gudex, M.D., Oshkosh
*F. P. Daly, M.D., Chippewa Falls
*R. L. Frisbie, M.D., Rhinelander
Bureau of vital statistics:
*C. A. Harper, M.D., State registrar, Madison
*L. W. Hutchcroft, statistician, Madison
Bureau of communicable diseases:
*H. M. Guilford, M.D., director, Madison
Bureau of sanitary engineering:
*L. F. Warrick, State sanitary engineer, Madison
*O. J. Muegge, assistant sanitary engineer, Madison
*E. J. Beatty, assistant sanitary engineer, Madison
*J. M. Holderby, assistant sanitary engineer, Madison
*E. J. Tully, chemical engineer, Madison
Bureau of education:
*John Culnan, director, Madison
Bureau of child welfare:
*Charlotte Calvert, M.D., director, Madison
*Frances Cline, M.D., child-health physician, Madison
*Margaret Nelson, M.D., child-health physician, Madison
*Elizabeth Taylor, M.D., child-health physician
*Helen Thayer, organizer of infant hygiene courses, Madison
Bureau of public-health nursing:
*Cornelia Van Kooy, R.N., director, Madison
*Edith L. Olson, R.N., field advisory nurse, Madison
*Ada Newman, R.N., field advisory nurse, Madison
*Martha Jenny, R. N., field advisory nurse, Madison
Bureau of nursing education:
*Adda Eldredge, R.N., director, Madison
Bureau of plumbing and domestic sanitary engineering:
*Frank R. King, State domestic sanitary engineer, Madison
Bureau of social hygiene:
*H. M. Guilford, M.D., director, Madison
*Aimee Zillmer, lecturer, Madison
*D. M. Warner, lecturer, Madison
Laboratory service:
*W. D. Stovall, M.D., director, State laboratories, Madison
*M. S. Nichols, chemist, State laboratory, Madison
*Anna Brandsmark, director, branch laboratory, Rhinelander

WISCONSIN—Continued

Laboratory service—Continued.
*Mildred Englebert, director, cooperative laboratory, Beloit
*Marjorie Bates, director, cooperative laboratory, Oshkosh
*Henry Miller, director, cooperative laboratory, Kenosha
*Josephine Foote, director, cooperative laboratory, Wausau
*Martha Thompson, director, cooperative laboratory, Superior
*Clarissa McFetridge, director, cooperative laboratory, Green Bay
*Elizabeth Mathewson, director, cooperative laboratory, Sheboygan

Appropriations for each of fiscal years ending June 30, 1934 and 1935:

General administration	$135,000
Licensing:	
Embalmers	5,000
Hotels and restaurants	27,000
Barbers	15,000
Plumbers	16,000
Beauty parlors	15,000
Nurses	16,000
(All monies received as license fees revert directly to the State general fund and the above amounts are appropriated for the various departments' use in each field.)	
Bureau of child welfare and public health nursing	43,350
Enforcement of medical practices act	2,500
Total	274,850

Publications issued by health department:
Quarterly bulletin
Biennial report
Other bulletins on communicable diseases

WYOMING

Board of health:
Earl Whedon, M.D., president, Sheridan
J. R. Nagle, M.D., vice president, Worland
W. H. Hassed, M.D., secretary and executive officer, Cheyenne
B. V. McDermott, M.D., Hanna
Evald Olson, M. D., Meeteetse
W. H. Hassed, M.D., State health officer, Cheyenne
Executive health officer:
*W. H. Hassed, M.D., State health officer, Cheyenne

Appropriations for biennial period ending Mar. 31, 1935:

State board of health	$9,000
Salary of secretary	8,000
Maternal and infant welfare	5,000
Bureau of vital statistics	2,800
Total	24,800

DEATHS DURING WEEK ENDED DECEMBER 2, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Dec. 2, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	8,110	8,427
Deaths per 1,000 population, annual basis	11.4	12.0
Deaths under 1 year of age	558	627
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	47	51
Deaths per 1,000 population, annual basis, first 48 weeks of year	10.9	11.0
Data from industrial insurance companies:		
Policies in force	67,368,613	69,717,605
Number of death claims	11,301	13,247
Death claims per 1,000 policies in force, annual rate	8.7	9.9
Death claims per 1,000 policies, first 48 weeks of year, annual rate	9.7	9.5

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended December 9, 1933, and December 10, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 9, 1933, and Dec. 10, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 9, 1933	Week ended Dec. 10, 1932	Week ended Dec. 9, 1933	Week ended Dec. 10, 1932	Week ended Dec. 9, 1933	Week ended Dec. 10, 1932	Week ended Dec. 9, 1933	Week ended Dec. 10, 1932
New England States:								
Maine	4	2	6		1	2	0	0
New Hampshire	4				104		0	0
Vermont	1	2			113	1	0	0
Massachusetts	33	36		8	556	132	1	1
Rhode Island					8		0	0
Connecticut	5	11	10	7	10	23	0	0
Middle Atlantic States:								
New York	51	70	[1] 22	[1] 30	537	515	10	5
New Jersey	19	36	22	20	48	169	4	5
Pennsylvania	56	92			249	250	1	8
East North Central States:								
Ohio	87	56	5	256	85	284	0	2
Indiana	98	77	27	440	31	17	2	4
Illinois	58	66	19	119	33	87	7	7
Michigan	15	32	9	21	50	344	2	0
Wisconsin	19	16	40	65	135	215	4	1
West North Central States:								
Minnesota	6	16		3	39	168	0	0
Iowa [2]	11	14	1		2		0	0
Missouri	83	48	9	123	92	31	1	0
North Dakota	6	8			28	78	0	0
South Dakota	38	18		1	298	4	0	1
Nebraska	4	7		6	13	1	2	0
Kansas	38	29	4	37	45	4	3	1
South Atlantic States:								
Delaware		4	3	6		1	1	0
Maryland [2, 3]	27	17	32	57	8	8	0	0
District of Columbia	10	10	2	13	31	2	0	0
Virginia	81	47			45	187	3	0
West Virginia	64	41	65	24	7	116	4	1
North Carolina [4]	86	48	16	68	470	96	2	2
South Carolina [4]	28	13	569	1,092	91	9	0	0
Georgia [4]	26	23		2,079	375	11	0	0
Florida [4]	9	20	2	22		1	0	0
East South Central States:								
Kentucky	72	48		683	5		3	1
Tennessee	51	46	47	1,881	153		2	1
Alabama [4]	40	52	95	6,687	54		0	2
Mississippi [2]	16	23					0	2
West South Central States:								
Arkansas	26	20	32	1,090	116	1	0	0
Louisiana	24	26	22	7,149	10	1	0	0
Oklahoma [5]	63	44	48	469	63	3	3	0
Texas [4]	250	207	197	530	70	59	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 9, 1933, and Dec. 10, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 9, 1933	Week ended Dec. 10, 1932	Week ended Dec. 9, 1933	Week ended Dec. 10, 1932	Week ended Dec. 9, 1933	Week ended Dec. 10, 1932	Week ended Dec. 9, 1933	Week ended Dec. 10, 1932
Mountain States:								
Montana [3]	3		10	371	2	216	1	0
Idaho	1	3		4	20		0	1
Wyoming				30	14	11	0	0
Colorado	12	7	37	463	5	9	0	0
New Mexico	4	12		11	61		0	0
Arizona	4	7	6	238	6		0	0
Utah [2]		3	3	14	233	5	0	1
Pacific States:								
Washington	5	2	5	5	111	3	5	1
Oregon	9		16	457	21	51	0	2
California	42	67	44	1,565	167	42	1	1
Total	1,589	1,426	1,431	26,144	4,615	3,157	62	45

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 9, 1933	Week ended Dec. 10, 1932	Week ended Dec. 9, 1933	Week ended Dec. 10, 1932	Week ended Dec. 9, 1933	Week ended Dec. 10, 1932	Week ended Dec. 9, 1933	Week ended Dec. 10, 1932
New England States:								
Maine	0	0	9	29	0	0	0	13
New Hampshire	0	0	5	22	0	0	2	2
Vermont	0	0	4	11	0	0	0	0
Massachusetts	3	1	183	378	0	0	6	3
Rhode Island	0	0	18	43	0	0	0	1
Connecticut	1	0	76	90	0	0	0	1
Middle Atlantic States:								
New York	8	6	484	623	0	3	11	14
New Jersey	2	2	136	229	0	0	4	6
Pennsylvania	4	3	459	601	0	0	11	17
East North Central States:								
Ohio	0	2	623	406	0	16	11	14
Indiana	1	0	190	116	5	9	2	2
Illinois	0	3	409	434	2	4	16	20
Michigan	1	1	335	300	4	2	7	6
Wisconsin	1	0	119	104	37	3	1	1
West North Central States:								
Minnesota	0	0	58	68	0	1	5	2
Iowa [2]	2	0	100	32	8	26	4	1
Missouri	0	0	159	94	1	0	4	2
North Dakota	0	0	48	21	0	4	6	1
South Dakota	0	1	30	13	1	3	0	2
Nebraska	0	0	70	20	2	1	5	0
Kansas	0	0	123	84	1	1	1	1
South Atlantic States:								
Delaware	0	0	15	10	0	0	1	2
Maryland [2 3]	0	1	106	130	0	0	11	11
District of Columbia	0	0	17	26	0	0	2	0
Virginia	0	0	154	100	0	0	15	15
West Virginia	0	0	150	65	1	2	13	15
North Carolina [4]	0	1	137	102	0	0	8	10
South Carolina [4]	2	0	12	10	0	0	9	3
Georgia [4]	0	0	17	18	0	0	9	12
Florida [4]	1	1	3	14	0	0	0	2
East South Central States:								
Kentucky	0	1	99	44	0	0	13	6
Tennessee	0	0	91	62	4	0	12	8
Alabama [4]	0	2	35	48	0	0	3	8
Mississippi [2]	0	0	33	26	1	2	3	4
West South Central States:								
Arkansas	0	0	42	19	3	4	1	3
Louisiana	1	1	30	12	1	5	24	17
Oklahoma [5]	0	1	41	45	1	0	17	7
Texas [4]	0	0	150	170	6	6	42	14

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 9, 1933, and Dec. 10, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 9, 1933	Week ended Dec. 10, 1932	Week ended Dec. 9, 1933	Week ended Dec. 10, 1932	Week ended Dec. 9, 1933	Week ended Dec. 10, 1932	Week ended Dec. 9, 1933	Week ended Dec. 10, 1932
Mountain States:								
Montana [3]	0	0	21	18	0	2	2	2
Idaho	0	0	11	10	0	4	1	1
Wyoming	0	1	2	2	0	0	0	1
Colorado	0	0	17	25	7	2	2	0
New Mexico	0	0	32	16	0	0	9	2
Arizona	0	0	11	53	0	0	5	0
Utah [2]	0	1	14	23	0	0	2	0
Pacific States:								
Washington	3	2	41	28	6	2	10	9
Oregon	0	0	41	17	3	5	2	1
California	7	2	221	130	13	16	36	6
Total	37	33	5,181	4,941	107	123	348	268

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Rocky Mountain spotted fever, week ended Dec. 9, 1933, 2 cases, as follows: Maryland, 1; Montana, 1.
[4] Typhus fever, week ended Dec. 9, 1933, 35 cases, as follows: North Carolina, 12; South Carolina, 1; Georgia, 12; Florida, 1; Alabama, 5; Texas, 4.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
October 1933										
Florida		40	4	185	5	2	0	8	0	16
November 1933										
Arkansas		145	102	244	551	27	4	117	3	18
Connecticut	5	41	26		37		3	268	0	5
Delaware	2	6			5		0	24	0	14
Missouri	5	363	30	4	96		2	588	15	18
North Dakota		56	4		77		2	151	0	3
Wyoming		4			45		0	37	0	2

October 1933	Cases
Florida:	
Chicken pox	6
Dengue	1
Dysentery	1
Mumps	14
Typhus fever	7
Whooping cough	8
November 1933	
Chicken pox:	
Arkansas	50
Connecticut	440
Delaware	53
Missouri	209
North Dakota	225
Wyoming	70
Dysentery:	
Connecticut (amoebic)	4
Connecticut (bacillary)	1
Missouri	12
North Dakota (amoebic)	4

November 1933—Con.	Cases
German measles:	
Connecticut	2
Wyoming	44
Impetigo contagiosa:	
Wyoming	1
Lead poisoning:	
Connecticut	1
Lethargic encephalitis:	
Connecticut	1
Missouri	36
Mumps:	
Arkansas	23
Connecticut	186
Missouri	67
North Dakota	3
Wyoming	8
Paratyphoid fever:	
North Dakota	1
Psittacosis:	
Connecticut	1
Rabies in animals:	
Connecticut	8
Missouri	8

November 1933—Con.	Cases
Scabies:	
Arkansas	7
Septic sore throat:	
Connecticut	2
Missouri	33
Wyoming	3
Tetanus:	
Connecticut	3
Trachoma:	
Arkansas	2
Tularaemia:	
Arkansas	1
Missouri	8
Undulant fever:	
Connecticut	5
Delaware	3
Missouri	2
North Dakota	1
Whooping cough:	
Arkansas	21
Connecticut	203
Delaware	39
Missouri	126
North Dakota	54
Wyoming	12

WEEKLY REPORTS FROM CITIES

City reports for week ended Dec. 2, 1933

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Maine:											
Portland	0	------	0	0	3	0	0	0	0	0	20
New Hampshire:											
Concord	0	------	0	0	0	0	0	0	0	0	17
Nashua	0	------	0	1	0	4	0	0	0	0	0
Vermont:											
Barre	1	------	0	44	0	2	0	0	0	5	0
Burlington	3	------	0	0	0	0	0	0	0	1	4
Massachusetts:											
Boston	7	------	0	127	30	43	0	11	0	57	234
Fall River	0	------	0	0	3	2	0	6	0	2	34
Springfield	0	------	0	0	2	1	0	2	0	11	35
Worcester	1	------	0	223	4	4	0	2	0	6	45
Rhode Island:											
Pawtucket	2	------	0	0	0	2	0	0	0	0	22
Providence	1	------	1	0	8	6	0	2	1	29	62
Connecticut:											
Bridgeport	0	------	0	0	3	5	0	1	0	5	37
Hartford	1	1	0	0	1	15	0	1	0	4	43
New Haven	0	1	0	0	0	1	0	0	0	2	37
New York:											
Buffalo	1	------	3	48	20	24	0	6	0	11	152
New York	44	30	11	28	152	112	0	79	2	90	1,462
Rochester	0	------	0	2	8	11	0	0	0	15	65
Syracuse	0	------	0	0	4	3	0	1	0	30	43
New Jersey:											
Camden	1	2	1	0	6	5	0	1	1	1	42
Newark	0	2	1	0	22	9	0	5	0	14	106
Trenton	1	------	0	0	3	9	0	2	0	2	33
Pennsylvania:											
Philadelphia	5	20	11	122	54	59	0	27	1	37	517
Pittsburgh	8	6	4	0	20	28	0	6	0	22	166
Reading	0	------	0	9	5	3	0	1	0	10	34
Scranton	0	------	0	0	1	4	0	0	0	0	0
Ohio:											
Cincinnati	8	------	0	74	7	19	0	6	0	14	134
Cleveland	7	42	2	4	15	60	0	7	0	70	180
Columbus	1	------	0	0	3	34	0	4	0	0	91
Toledo	2	------	0	2	2	34	0	4	0	9	52
Indiana:											
Fort Wayne	9	------	0	0	0	7	0	0	0	0	27
Indianapolis	11	------	1	0	17	15	0	3	3	4	------
South Bend	1	------	1	3	0	8	0	0	4	0	23
Terre Haute	2	------	0	9	3	1	0	1	0	0	13
Illinois:											
Chicago	0	8	4	4	56	155	0	35	2	70	697
Springfield	0	------	0	3	3	6	0	0	0	3	20
Michigan:											
Detroit	13	9	2	1	22	62	0	15	1	59	236
Flint	1	------	0	1	1	25	0	2	0	2	21
Grand Rapids	1	------	0	1	3	4	0	1	0	0	34
Wisconsin:											
Kenosha	0	------	0	1	0	15	0	0	0	4	7
Madison	0	------	------	0	------	2	0	1	0	22	24
Milwaukee	0	3	3	5	8	19	0	3	1	73	95
Racine	0	------	0	0	0	8	0	0	0	5	8
Superior	0	------	0	1	0	1	0	0	0	0	7
Minnesota:											
Duluth	0	------	0	0	0	3	0	0	0	4	23
Minneapolis	7	------	0	1	3	14	0	1	0	8	76
St. Paul	1	------	0	0	8	9	0	0	0	3	78
Iowa:											
Des Moines	3	------	------	0	------	12	3	------	0	1	26
Sioux City	2	------	------	0	------	7	0	------	0	1	------
Waterloo	0	------	0	1	------	0	0	------	0	0	------
Missouri:											
Kansas City	8	1	1	1	9	23	0	6	0	5	86
St. Joseph	6	------	0	1	5	1	0	2	0	0	43
St. Louis	15	------	------	29	17	31	0	10	5	25	215
North Dakota:											
Fargo	0	------	0	1	0	1	0	0	0	1	0
Grand Forks	0	------	0	1	0	0	0	0	0	3	0

City reports for week ended Dec. 2, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
South Dakota:											
Aberdeen	0	------	0	0	0	0	0	0	0	0	0
Sioux Falls	0	------	0	50	0	0	0	0	0	0	7
Nebraska:											
Omaha	0	------	0	5	5	7	1	0	0	1	44
Kansas:											
Topeka	0	------	0	0	3	7	0	0	1	4	22
Wichita	0	------	0	0	2	6	0	0	0	0	28
Delaware:											
Wilmington	0	------	0	1	4	0	0	0	1	2	30
Maryland:											
Baltimore	5	11	1	0	23	30	0	11	1	55	217
Cumberland	1	------	0	0	1	3	0	0	0	2	12
Frederick	0	------	0	0	0	3	0	0	0	0	1
District of Columbia:											
Washington	17	1	1	18	14	12	0	10	1	20	164
Virginia:											
Lynchburg	0	------	0	0	0	5	0	1	1	1	6
Richmond	1	------	0	0	3	12	0	1	0	1	50
Roanoke	9	------	0	0	2	7	0	0	0	0	15
West Virginia:											
Charleston	6	1	0	0	3	4	0	0	0	0	21
Huntington	4	------	0	0	0	10	0	0	0	0	0
Wheeling	1	------	0	1	3	6	0	0	0	2	21
North Carolina:											
Raleigh	1	------	0	0	3	1	0	0	1	2	12
Wilmington	------	------	------	------	------	------	------	------	------	------	------
Winston-Salem	13	------	0	138	2	12	0	1	0	0	18
South Carolina:											
Charleston	0	42	0	0	9	0	0	1	0	2	26
Columbia	0	------	0	0	1	0	0	0	0	0	10
Greenville	0	------	0	0	1	1	0	0	0	0	16
Georgia:											
Atlanta	5	14	2	1	6	5	0	2	0	3	76
Brunswick	0	------	0	1	0	0	0	0	0	0	3
Savannah	0	19	1	0	6	3	0	0	1	0	36
Florida:											
Miami	0	------	0	0	0	0	0	1	0	4	16
Tampa	2	------	0	0	0	2	0	2	0	1	24
Kentucky:											
Ashland	1	------	------	0	------	1	0	------	2	3	------
Lexington	1	------	0	0	1	1	0	------	1	0	12
Louisville	15	------	0	1	6	9	0	1	0	2	74
Tennessee:											
Memphis	9	------	0	2	11	19	0	3	1	1	89
Nashville	0	------	1	3	4	6	0	2	0	2	49
Alabama:											
Birmingham	11	2	1	1	9	10	0	4	1	1	93
Mobile	2	------	0	0	5	0	0	0	0	0	33
Montgomery	2	------	------	0	------	3	0	------	1	0	------
Arkansas:											
Fort Smith	2	------	------	0	------	2	0	------	0	3	------
Little Rock	1	------	0	5	1	0	0	0	0	0	1
Louisiana:											
New Orleans	8	2	5	3	13	6	0	8	2	0	152
Shreveport	5	------	0	0	3	2	0	0	0	0	33
Texas:											
Dallas	26	1	1	0	5	5	0	3	[1] 1	0	71
Fort Worth	8	------	0	0	2	7	0	1	1	2	37
Galveston	3	------	0	0	1	2	0	1	0	0	18
Houston	16	------	2	0	6	7	0	6	0	0	82
San Antonio	7	------	1	0	4	6	0	6	0	5	64
Montana:											
Billings	0	------	0	0	0	1	0	0	0	0	4
Great Falls	0	------	0	0	0	0	0	0	0	1	8
Helena	0	------	0	0	0	2	0	0	0	0	1
Missoula	0	------	0	0	1	0	0	0	0	0	10
Idaho:											
Boise	0	------	0	1	0	0	0	0	0	1	5
Colorado:											
Denver	2	37	1	1	7	19	0	2	1	24	66
Pueblo	0	------	0	0	1	0	0	0	0	5	5

[1] Imported.

City reports for week ended Dec. 2, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
New Mexico:											
Albuquerque	1	------	0	0	4	2	0	2	0	2	12
Utah:											
Salt Lake City	0	------	0	73	2	9	0	2	0	9	35
Nevada:											
Reno	0	------	0	0	0	0	0	0	0	0	0
Washington:											
Seattle	0	------	------	2	4	2	0	9	1	35	71
Spokane	0	------	------	76	4	3	0	------	0	0	30
Tacoma	0	------	0	0	3	3	0	2	1	15	31
Oregon:											
Portland	0	------	0	0	5	17	3	2	0	0	69
Salem	0	------	0	0	0	1	0	0	0	0	0
California:											
Los Angeles	16	38	0	7	15	58	2	12	5	49	239
Sacramento	0	------	0	4	3	3	0	1	1	0	25
San Francisco	4	------	2	0	8	5	0	9	0	15	157

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts:			
Fall River	0	0	1
Worcester	0	0	1
Connecticut:			
Hartford	1	0	0
New York:			
New York	2	3	0
Pennsylvania:			
Pittsburgh	2	0	0
Indiana:			
Indianapolis	1	1	0
Illinois:			
Chicago	5	0	0
Wisconsin:			
Madison	0	0	1
Milwaukee	1	0	0
Minnesota:			
St. Paul	0	0	2
Missouri:			
St. Joseph	0	1	0
St. Louis	2	1	0

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Kansas:			
Topeka	0	1	0
Maryland:			
Baltimore	0	0	2
Cumberland	0	1	0
Georgia:			
Atlanta	1	0	0
Tennessee:			
Nashville	1	1	0
Texas:			
Galveston	1	0	0
Houston	0	0	1
Montana:			
Missoula	0	0	1
Colorado:			
Denver	0	0	1
Utah:			
Salt Lake City	0	0	1
California:			
Los Angeles	1	0	2
San Francisco	1	0	0

Lethargic encephalitis.—Cases: New York, 2; Cincinnati, 1; Cleveland, 2; Detroit, 1; Grand Rapids, Mich., 1; St. Louis, 3; Richmond, Va., 1; Birmingham, 2; Dallas, Tex., 1; Portland, Oreg., 1.

Pellagra.—Cases: Washington, D.C. 1; Savannah, 1; Memphis, 1; Dallas, Tex., 1.

Typhus fever.—Cases: Providence, R.I., 2 (imported); Atlanta, 2; Houston, Tex., 1.

FOREIGN AND INSULAR

CANADA

Quebec Province—Communicable diseases—Two weeks ended December 2, 1933.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended December 2, 1933, as follows:

Disease	Cases	Disease	Cases
Chicken pox	423	Poliomyelitis	1
Cerebrospinal meningitis	1	Puerperal septicemia	8
Diphtheria	56	Scarlet fever	163
Dysentery	1	Smallpox	1
Erysipelas	9	Trachoma	1
German measles	5	Tuberculosis	129
Influenza	13	Typhoid fever	53
Measles	107	Whooping cough	259

CHINA

Manchuria—Plague.—According to information dated October 25, 1933, plague had been present in certain parts of Manchuria, principally in the region between the Ssupingkai-Taonan Railway and the southern line of the Chinese Eastern Railway, as well as in places adjacent to the lines of the Ssupingkai-Taonan, Ssupingkai-Tungliao, and Tahushan-Tungliao Railways, since the month of August 1933. On September 18 it was reported that 200 persons had died in 23 Chinese villages near Nungan from a disease later proved by bacteriological examination to be bubonic and pneumonic plague. At that time cases were also reported from the regions of Tungliao, Kaitung, Chienan, and Angkuan.

Control measures had been instituted along the railway lines mentioned, as well as along the lines of the South Manchurian Railway, rodent destruction being carried on, cars disinfected, and passenger and commercial traffic prohibited at certain stations. Sanitary detachments had been dispatched to the infected regions of Tungliao, Kaitung, Changwu, Huaiteh, Chienchiatien, and Nungan.

It was reported on October 12 that the epidemic, which had been abating for some time, was again rampant south of Hungsing Station on the Ssupingkai-Taonan Railway, and in the region of Kaitung. No cases of plague had occurred in the zone of the Chinese Eastern Railway.

GREAT BRITAIN

Scotland—Vital statistics—Quarter ended September 30, 1933.—The Registrar General of Scotland has published the following vital statistics for the third quarter, ended September 30, 1933:

Population, estimated	4,916,000	Deaths from—Continued.	
Births	21,136	Lethargic encephalitis	20
Birth rate per 1,000 population	17.1	Malaria	2
Deaths	13,094	Measles	4
Deaths per 1,000 population	10.6	Nephritis, acute	47
Deaths under 1 year	1,343	Nephritis, chronic	239
Deaths under 1 year per 1,000 births	64	Nephritis, unspecified	86
Marriages	10,252	Paratyphoid fever	8
Deaths from:		Pneumonia, lobar	202
Bronchitis	330	Pneumonia, unspecified	125
Broncho-pneumonia	307	Poliomyelitis	10
Cancer	1,865	Puerperal sepsis	40
Cerebrospinal fever	36	Scarlet fever	51
Diabetes	145	Syphilis	18
Diphtheria	74	Tetanus	11
Dysentery	3	Tuberculosis	822
Erysipelas	28	Typhoid fever	5
Heart disease	2,110	Whooping cough	99
Influenza	39		

PUERTO RICO

Notifiable diseases—4 weeks ended December 2, 1933.—During the 4 weeks ended December 2, 1933, cases of certain notifiable diseases were reported in the municipalities of Puerto Rico, as follows:

Disease	Cases	Disease	Cases
Chicken pox	18	Paratyphoid fever	4
Conjunctivitis	1	Pellagra	2
Diphtheria	69	Puerperal fever	3
Dysentery	119	Ringworm	5
Erysipelas	2	Syphilis	29
Filariasis	7	Tetanus	5
Framboesia	4	Tetanus, infantile	2
Influenza	218	Trachoma	69
Malaria	[1] 7,670	Tuberculosis	466
Measles	92	Typhoid fever	13
Mumps	41	Whooping cough	194
Ophthalmia neonatorum	7		

[1] Includes results from a special survey.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Nov. 24, 1933, pp. 1431–1442. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Dec. 29, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Philippine Islands.—During the week ended December 9, 1933, cholera was reported in the Philippine Islands as follows: Bohol Province—Calape, 2 cases, 1 death; Clarin, 4 cases, 2 deaths; Inabanga, 7 cases, 4 deaths; Tubigon, 10 cases, 9 deaths. Cebu Province—Argao, 5 cases, 6 deaths; Bantayan, 1 case, 1 death; Campostela, 2 cases, 2 deaths; Liloan, 1 case; Toledo, 1 case. Occidental Negros Province—San Carlos, 2 cases, 2 deaths. Oriental Negros Province—Tanjay, 1 case, 1 death.

Plague

Hawaii Territory—Hawaii Island.—On December 1, 1933, 1 plague-infected rat was reported in Kalopa Homesteads, Hamakua District, Island of Hawaii.

Yellow Fever

Gold Coast—Oriental Province.—On November 29, 1933, 1 case of yellow fever was reported in Oriental Province, Gold Coast.

Senegal.—Yellow fever has been reported in Senegal as follows: Kaolak Circle, 2 cases, 1 death, December 1, 1933. Sebikotane, 1 case, 1 death, December 3, 1933.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

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DECEMBER 29 - - 1933

IN THIS ISSUE

Experimental Studies on Acute Mercurial Poisoning
Deaths in Large Cities During Week Ended December 9
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

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HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of public health.

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PUBLIC HEALTH REPORTS

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EXPERIMENTAL STUDIES ON ACUTE MERCURIAL POISONING

By SANFORD M. ROSENTHAL, *Senior Pharmacologist, National Institute of Health, United States Public Health Service*

Previous attempts, under experimental conditions, to combat acute mercurial poisoning have been largely of no avail. Considerable work with sodium thiosulphate has yielded negative results (Haskell (1); Young and Taylor (2)). Recently Hesse (3) was able to protect a certain percentage of rabbits, rats, mice, and guinea pigs against a fatal subcutaneous dose of mercuric chloride by the use of strontium thioacetate, but Haskell and Forbes (4) showed that in dogs no such antidotal effect could be demonstrated following oral or subcutaneous intoxication. This fact was confirmed by Hesse himself.

We have studied several compounds under various conditions and have obtained one which can be shown, if properly administered, to protect rats and dogs against lethal doses of mercuric chloride.

For such a drug to be of benefit following intravenous administration, it is necessary for it to be comparatively stable in the body, to be of low toxicity, and at the same time to be able to exist in the body in a state which will react with mercury to form compounds of diminished toxicity. Excretion in the urine is desirable, as this may bring about a concentration of the substance in the kidney cells.

Sodium thiosulphate ($Na_2S_2O_3$) has previously been studied in this respect and found inadequate (5). As will be shown here, it is not capable of protecting kidney tissue against bichloride or of forming in the blood stream insoluble compounds with mercury. Other substances which have been used, such as calcium sulphide and sodium hydrosulphite ($Na_2S_2O_4$), while forming insoluble sulphides with great ease in the test tube, are so unstable in the body that they are broken down almost immediately after injection.

THE ANTAGONISM OF MERCURY ACTION AS SHOWN UPON THE OXYGEN CONSUMPTION OF EXCISED RAT TISSUES

Sodium thiosulphate.—The oxygen consumption of tissues *in vitro* was determined with the Warburg micro-respiration apparatus in a manner previously described (6). Rat tissues were suspended in Locke's solution containing 0.03 percent sodium bicarbonate and 0.2 percent glucose. All experiments were run at 37.6° C. in an atmosphere of air.

The behavior of thiosulphate revealed that while no protection was afforded to kidney tissue against the action of mercury, with

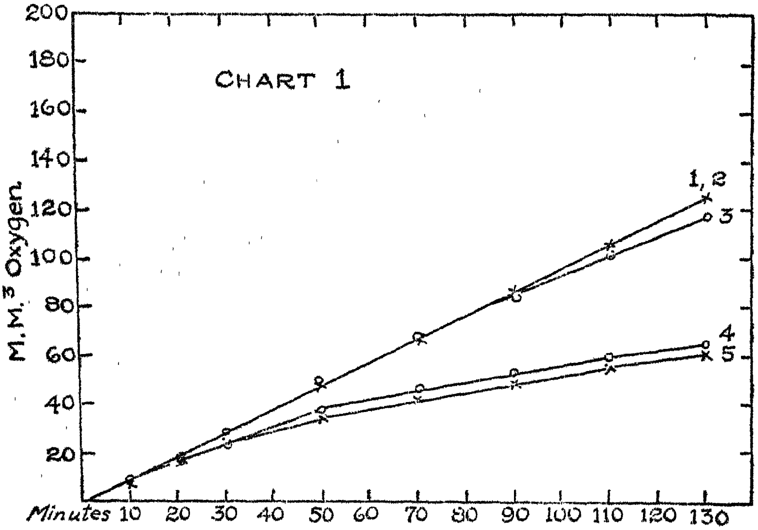

CHART 1.—The ability of thiosulphate to counteract the effect of $HgCl_2$ on rat testes if added before the mercury, but not if added later. Oxygen consumption of 100 mg rat testes in Locke's solution at 37.6° C. Atmosphere=air. Curve 1, testes alone. Curve 2, testes+m/500 thiosulphate. Curve 3, testes+m/500 thiosulphate+m/5000 $HgCl_2$. Curve 4, testes+$HgCl_2$, thiosulphate added in 10 minutes. Curve 5, testes+m/5000 $HgCl_2$.

other tissues its toxic effect can, under certain conditions, be completely antagonized.

Upon the oxygen consumption of rat testes, thiosulphate, when added first in amounts 10 times the molar quantity of the mercury, afforded complete protection against the toxic action of mercury. If the mercury was added first, and the thiosulphate later, no protection was observed (chart 1).

Upon the oxygen consumption of minced rat liver, thiosulphate gave a high degree of protection when added to the tissue either before or 5 minutes after the mercury was added (chart 2).

With the rat kidney, however, no protection could be obtained against the action of mercury, whether the thiosulphate was added before or after the mercury, and even when 20 times the molar

concentration of thiosulphate was used (chart 2). The basis for this lack of protection of renal tissue by thiosulphate is unknown, but it is possible that therein may lie the explanation for the selective nephrotoxic action of mercury.

Experiments on glutathione.—Glutathione, in its reduced state, is a sulphur compound related to cysteine, and also occurrs as a physiological constituent of animal tissues. Voegtlin, Dyer, and

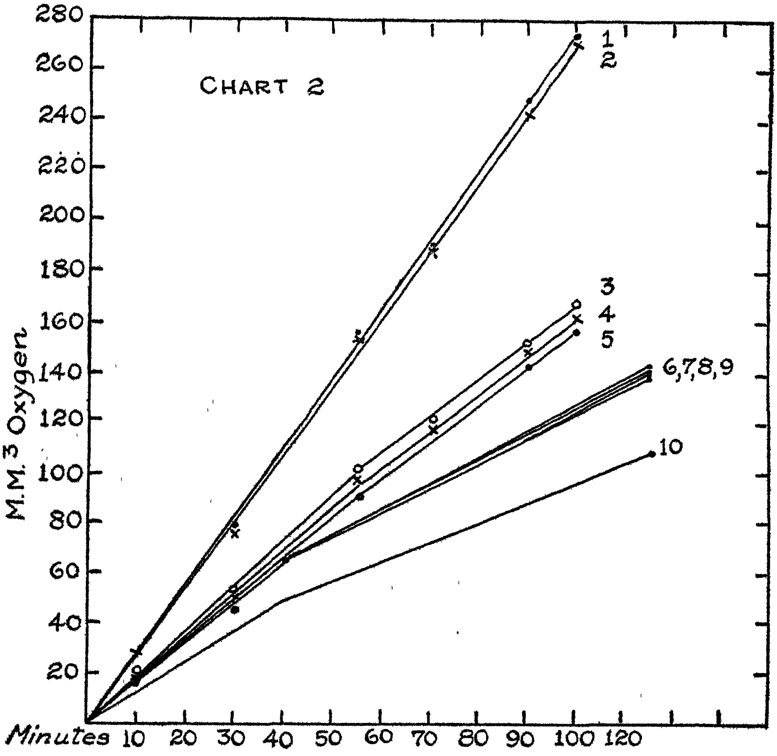

CHART 2.—The antagonism of $HgCl_2$ by thiosulphate on liver tissue, and lack of effect on kidney. Oxygen consumption of 75 mg rat kidney. Curve 1, kidney. Curve 2, kidney+m/250 thiosulphate. Curve 3, kidney+m/5000 $HgCl_2$. Curve 4, kidney+m/5000 $HgCl_2$, m/250 thiosulphate 15 minutes later. Curve 5, kidney+thiosulphate, $HgCl_2$ added 2 minutes later. Curve 6, 100 mg rat liver. Curve 7, liver+m/250 thiosulphate. Curve 8, liver+m/250 thiosulphate, m/2500 $HgCl_2$ added in 2 minutes. Curve 9, liver+$HgCl_2$, thiosulphate added 5 minutes later. Curve 10, liver+$HgCl_2$.

Leonard (7) showed that the toxic action of arsenic could be counteracted by this compound, and further work on its chemical and physiological properties has been carried out in this laboratory (8, 9).

Glutathione is superior to thiosulphate in the protection of rat tissues *in vitro* against mercury action. This was manifested in that protection could be demonstrated when the glutathione was added 10 minutes or longer after the addition of the mercury, and

[1] The crystalline reduced glutathione used in these experiments was prepared by Dr. J. M. Johnson of this laboratory.

further in that this protection also existed for renal tissues. When from 5 to 10 times the molar quantity of glutathione [1] was used, as of mercuric chloride, the protection was almost complete, whether the glutathione was added either before or shortly after the mercury (chart 3). In the interpretation of chart 3, our previous work must be recalled (6) in which it was shown that glutathione, in the presence of renal tissue, slowly underwent oxidation, so that this added oxygen consumption must be taken into account in the experiments on kidney tissue. With other tissues glutathione

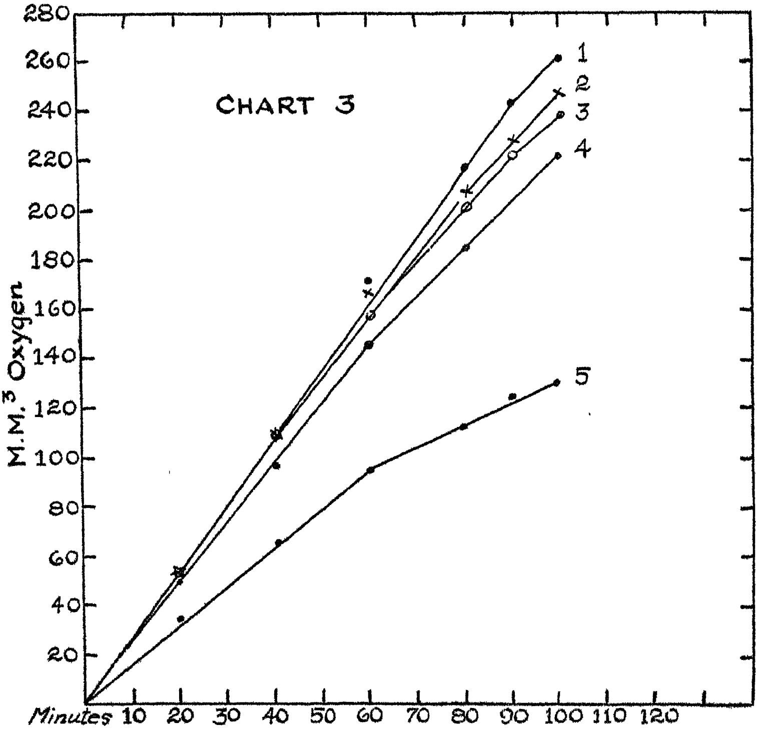

CHART 3.—The ability of SH glutathione to protect kidney tissue against mercury. Curve 1, oxygen consumption of 60 mg of rat kidney+m/500 glutathione. Curve 2, kidney+glutathione, m/5000 $HgCl_2$ in 2 minutes. Curve 3, kidney+$HgCl_2$, glutathione added 10 minutes later. Curve 4, kidney alone. Curve 5, kidney+m/5000 $HgCl_2$. Oxygen requirements of the glutathione=27 mm³ of O_2.

in similar concentrations is kept largely reduced. In experiments on rat testes, some protection could be demonstrated from glutathione added up to 50 minutes following the bichloride.

Formaldehyde sulphoxylate (*$NaHSO_2 \cdot CH_2O \cdot 2H_2O$, rongalite, formopone.*)—Sodium formaldehyde sulphoxylate is a product formed by the union of sodium hydrosulphite ($Na_2S_2O_4$) and formaldehyde. The ensuing product is a powerful reducing agent which, however, is considerably less toxic than either of its components, and at the same time is much more stable in the animal organism. We have

recrystallized formaldehyde sulphoxylate from the technical product according to the following method supplied us by Dr. A. E. Sherndal, of Metz & Co.:

Two hundred grams are dissolved in 90 cc of water by gentle heating to 70° C. If the solution is not alkaline to litmus, add some sodium carbonate. There should be a formaldehyde odor to the solution. Filter through a hot suction funnel and cool down the filtrate in ice water. When all of the crystals have

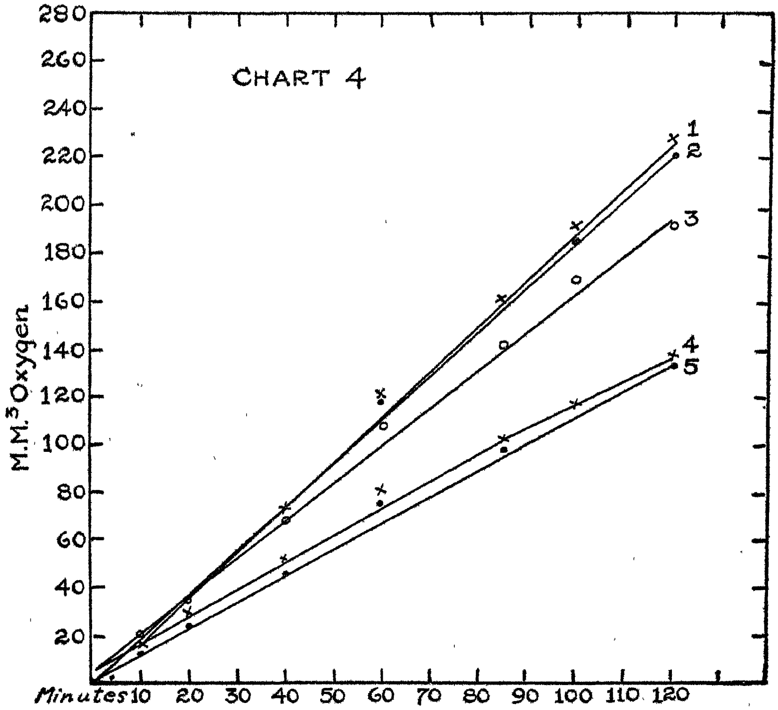

CHART 4.—The ability of formaldehyde sulphoxylate to afford protection to kidney tissue against a subsequent addition of $HgCl_2$. Curve 1, 50 mg rat kidney+m/250 sulphoxylate. Curve 2, kidney alone. Curve 3, kidney+sulphoxylate, m/5000 $HgCl_2$ added in 3 minutes. Curve 4, kidney+$HgCl_2$, sulphoxylate added in 15 minutes. Curve 5, kidney+m/5000 $HgCl_2$. Similar results were obtained with 100 mg of rat testes.

precipitated, filter them off on a suction funnel, wash once with a small amount of cold water, and press out as dry as possible.

We have sealed these crystals in ampoules with the exclusion of air and found them stable for a period of weeks, at least. While the copper sulphate titration is the standard method of assay, we have found simple iodine titration of the aqueous solution after the method of Elvove (14) sufficiently accurate to detect deterioration. One hundred milligrams of the moist crystals dissolved in water should consume from 23 to 26 cc of 0.1 normal iodine, dependent on the amount of moisture.[2]

[2] We are indebted to Metz & Co., Merck & Co., and Diarsenol Co., for a supply of the sulphoxylate.

The ability of sulphoxylate to alter the reducing power of tissues and of the gastro-intestinal tract will be made the subject of another communication. Some results pertinent to the present investigation will be described in a later section of this paper.

Upon the oxygen consumption of rat testes and kidney, sulphoxylate afforded protection against mercury bichloride if the sulphoxylate was added first. No appreciable protection was observed if the sulphoxylate was added from 15 to 45 minutes following the mercury. The molar concentrations employed (m/250) were 20 times those of mercury. In these concentrations the sulphoxylate alone did not alter the oxygen uptake of the tissues, as shown in the control vessels set up for such determinations (chart 4). It is likely that in these *in vitro* experiments the protection afforded the excised rat tissues is largely concerned with the formation of insoluble mercury compounds, although we were unable to detect precipitates in the presence of the suspensions of tissue.

THE ABILITY OF THIOSULPHATE AND GLUTATHIONE TO PROTECT SUBCUTANEOUS TISSUES AGAINST THE ACTION OF MERCURY

Another example of the ability of thiosulphate to protect certain tissues was shown in the prevention of the local inflammatory action of mercury when injected subcutaneously. When two hundredth molar bichloride of mercury was injected under the skin of the shaved ear of an albino rabbit, marked inflammation and local ulceration occurred. When this concentration of bichloride in tenth molar thiosulphate solution was used, slight or no inflammation and no ulceration followed. Equal volumes of the solutions of twice the desired strength were mixed immediately before injection, and no precipitate could be observed. Three injections of 0.1 cc each were made into each ear of 2 rabbits, 1 ear being employed as a control for the mercury alone. The same experiment was performed on two dogs with the injection of 0.3 cc at each site. Practically complete protection was also present in these animals.

Protection of subcutaneous tissues could also be demonstrated when a mixture of two hundredth molar bichloride of mercury and tenth molar glutathione (neutralized) were injected subcutaneously into the ears of rabbits and dogs. No precipitate could be seen when the solutions were mixed shortly before their injection. The technique employed was the same as with thiosulphate, and the results were essentially similar.

Because of the fact that sulphoxylate, when added to mercuric chloride in even very dilute solutions, results immediately in a heavy precipitate, it was not feasible to demonstrate an antagonism by subcutaneous injection.

ANTIDOTAL ACTION FOLLOWING THE SYSTEMIC ADMINISTRATION OF MERCURIC CHLORIDE TO ANIMALS

Sodium thiosulphate.—The minimum lethal dose of mercuric chloride when injected intravenously within 2 minutes' time into albino rats (Buffalo strain) was found to be 0.28 cc of a m/400 solution per 100 g of body weight. With this amount, 13 of 15 rats died in from 1 to 7 days, with an average time of 3.3 days. With a dose of 0.2 cc of m/400 bichloride per 100 g, there were no deaths in 7 rats (table 1).

It was soon found that the weight of the rats was an important factor in bichloride toxicity, as the susceptibility of the animals increased with weight. The age factor as shown by MacNider (10) may be important here. As far as possible, rats below 150 g weight were employed in the following experiments:

Six rats, from 128 to 138 g, were injected intravenously with 0.4 cc of n/10 thiosulphate per 100 g (57 times the molar quantity of mercury) immediately before the injection of a lethal dose of bichloride. All of these animals died (table 1). On autopsy the kidneys presented a gross appearance typical of mercurial nephritis. These results are consistent with the absence of protection afforded excised kidney tissue in the studies dealing with oxygen consumption.

In view of the several investigations with negative results previously reported on the use of thiosulphate in mercurial intoxication in dogs (1, 2, 5), no further work with this compound was done upon them.

Glutathione.—Confirmatory of the results obtained on the oxygen uptake of rat tissues, glutathione proved an effective antidote for mercury intoxication in rats, even when injected subsequent to an intravenous injection of mercury.

TABLE 1.—*Intravenous toxicity of $HgCl_2$ to rats; the ability of glutathione injected intravenously to protect rats against a lethal dose of $HgCl_2$; the ability of sulphoxylate to protect rats if injected prior to the $HgCl_2$; the lack of effect of sodium thiosulphate*

Number of rats	Average weight	$HgCl_2$	Antidote	Effect: Survived	Effect: Died
7	163	0.20 cc n/400 per 100 g intravenously	None	7	0
3	153	0.28 cc n/400 per 100 g intravenously	do	0	3
5	138	do	do	0	5
7	111	do	do	2	5
6	131	do	Thiosulphate, 0.4 cc n/10 per 100 g before Hg.	0	6
5	137	do	Glutathione, 0.4 cc n/10 per 100 g before Hg.	3	2
7	118	do	do	7	0
5	119	do	Glutathione, 0.4 cc n/10 per 100 g ½ hour after Hg.	4	1
7	118	do	do	7	0
10	193	0.32 cc n/400 per 100 g intravenously	None	0	10
10	178	do	Sulphoxylate, 1 g per kilogram 25 minutes after Hg.	0	10
7	135.5	0.30 cc n/400 per 100 g intravenously	None	0	7
7	145	do	Sulphoxylate, 1 g per kilogram before Hg.	5	2

One group of 5 rats, weighing from 122 to 142 g, was injected intravenously with 0.4 cc of n/10 glutathione (freshly neutralized) per 100 g immediately before the injection of a lethal dose of bichloride. Three of these animals survived. In another group of 7 rats, weighing from 112 to 130 g, similarly treated, all survived (table 1).

Two groups of rats were injected intravenously with a similar quantity of glutathione in one half hour following the injection of the mercury. In one series of 5 rats weighing from 108 to 124 g, 4 survived. In another series of 7 rats, weighing from 112 to 130 g, all survived (table 1).

An attempt to establish the minimum lethal dose of bichloride of mercury by mouth to rats revealed that these animals could tolerate such large doses that it was considered too irregular a method to employ. Five groups of 5 rats each were used, and from 20 to 70 mg of bichloride per kilogram were introduced into the stomach through a catheter. Only 1 or 2 of each group succumbed to doses above 30 mg per kilogram.

Because of the difficulty of obtaining sufficient amounts of glutathione, experiments on dogs are incomplete.

The minimum lethal dose of bichloride when injected intravenously into dogs has been established as 4 mg per kilogram body weight (4). We have employed this dose in 8 dogs, with 7 of the 8 succumbing in an average of 4.4 days.

Two dogs were given an intravenous injection of 0.45 g of freshly neutralized reduced glutathione (100 times the molar concentration of bichloride) per kilogram just before the injection of 4 mg of bichloride per kilogram. The animals died 12 and 14 hours later (table 2). Conclusions drawn from these experiments must be modified by the fact that the sample of glutathione was not highly purified and by the obvious paucity of material. The experiments of Hesse, for instance, with strontium thioacetate, on rats, guinea pigs, and rabbits, indicate that an optimum dose existed, beyond which much less or no protection against mercury was afforded.

It may be that with a larger number of animals and with varying doses of glutathione, some protection can be shown; but with the evidence at hand it must be concluded that while glutathione affords an extraordinary degree of protection against mercuric poisoning in rats, it behaves similarly to strontium thioacetate in that it is ineffective in dogs. Glutathione may be rapidly broken down when injected into dogs, as Abderhalden (11) was unable to recover any from the urine of dogs following the subcutaneous injection of 1 g.

The above evidence is somewhat strengthened by the results with cysteine. Two dogs were injected with 0.23 g (100 times the molar quantity of mercury) of freshly neutralized cysteine hydrochloride per kilogram just before the intravenous injection of mercury,

and both animals died, one in 14 hours and the other in 3 days (table 2). Cystine, the oxidized state of cysteine, is known of itself to produce kidney lesions when injected into or fed to animals.

Formaldehyde sulphoxylate.—Some pharmacological characteristics of this compound will be later reported in greater detail. Some of the experiments bearing upon the present problem may be summarized as follows:

The toxicity is quite low. Intraperitoneal injections of 1 g (10 percent solution) per kilogram into rats daily for 3 to 4 weeks produced no visceral changes and no symptoms, except that in some cases there was less rapid gain in weight than in control animals. There was evidence of severe local pain for 2 or 3 minutes at the site of the intraperitoneal injection. The single intravenous injection of 1 g per kilogram of body weight into rats, guinea pigs, rabbits, and dogs (10 to 20 percent solution) if administered slowly (2 to 4 minutes) was attended by no symptoms and no after effects that we have observed.

When given by mouth in doses up to 1 g per kilogram to rats and rabbits, no symptoms were observed except slight diarrhea in rats, which cleared up by the following day.

The stability of sulphoxylate in the body is shown by the following experiments:

When 1 g of sulphoxylate per kilogram is injected intravenously into rats or rabbits, it can be demonstrated in the blood serum for at least 5 hours after the injection. Sulphoxylate can be detected in the serum in 2 ways: (1) To 2 drops of serum add an excess of ammonium sulphate crystals and then 1 drop of a dilute solution of sodium nitroprusside. A green color results. (2) The second method is based on the great ability of sulphoxylate to reduce mercuric salts to insoluble black mercurous compounds and metallic mercury. To approximately 0.5 cc of undiluted serum (in a small test tube) add 2 or 3 drops of a 0.2 percent aqueous solution of mercuric chloride. Normally no precipitate results; but after the above-stated dose of sulphoxylate a precipitate is formed which turns black and settles to the bottom of the tube. In rabbits this reaction was still positive 5 hours after the injection but negative the next day. A sample of serum allowed to stand in an open test tube at room temperature for several days still gave a strongly positive reaction.

Following the intravenous injection of 1 g of sulphoxylate per kilogram into rabbits, the nitroprusside test on the urine was strongly positive for at least 10 hours later, but negative the next day. Tests upon the feces and lower intestinal contents were negative.

When rats were fed through a catheter 1 g of sulphoxylate (10 percent solution) per kilogram, nitroprusside tests for sulphoxylate 1 hour after administration were positive throughout the gastrointestinal tract as far as the rectum. The feces of another rat were strongly

positive 3 hours after administration. Tests on the urine of rats and rabbits made up to 6 hours after the oral dosage were positive. In dogs with bichloride poisoning that were given by mouth 0.5 to 1.0 g sulphoxylate per kilogram, the liquid stools were strongly positive for sulphoxylate 1 hour later. While sulphoxylate is less stable in acid solution than in alkaline, evidence that only a small proportion would be destroyed by the gastric acidity was demonstrated in that a 1 percent solution made up in 0.1 normal hydrochloric acid and kept at 37 6° C. showed 92 percent (by iodine titration) still present after 1½ hours, 80 percent after 3 hours, 73 percent after 5½ hours, and 57 percent in 23 hours.

If solutions of mercuric chloride and sulphoxylate are mixed in a test tube, a precipitate forms which rapidly blackens with the formation of mercurous compounds. Since no black precipitate is obtained with lead acetate, this action is not due to the presence of sulphide ions. Upon standing, the reduction may be shown to proceed as far as the formation of metallic mercury (12). Precipitates can be detected in aqueous solutions of sulphoxylate of 1 part in 300,000 when a few drops of 1 percent bichloride are added. Likewise a precipitate can be observed when a few drops of 1 percent sulphoxylate are added to 1 to 80,000 bichloride.

In the test tube sodium thiosulphate does not form a precipitate with mercuric chloride except in fairly high concentrations, and in animals no such precipitating action could be demonstrated in the serum 15 minutes after the intravenous injection of 1 g of thiosulphate per kilogram.

Experimental studies on the antagonism of mercuric poisoning by sulphoxylate in rats also conformed with the results obtained upon excised rat tissues. Protection of rats from an *intravenous* injection of bichloride occurred only if the sulphoxylate had been administered previously.

A dose of bichloride slightly larger than the M.L D. was used and the one group of available rats was heavier than those previously employed, so that the test was more severe for the sulphoxylate. Ten rats averaging 178 g in weight received intravenously 0.32 cc of n/400 bichloride per 100 g. Twenty-five minutes later they were injected with 1 g of sulphoxylate per kilogram. All animals died, on an average, in 3 days. Ten control rats of an average weight of 193 g died, on an average, in 2.3 days.

Seven rats averaging 145 g in weight received an injection of 1 g of sulphoxylate per kilogram just before the injection of 0.3 cc of n/400 mercuric chloride. Five of the seven rats survived. Of 7 control rats, with an average weight of 135.5 g, all died, on an average, in 4.4 days (table 2).

TABLE 2.—*The ability of sulphoxylate injected intravenously to protect dogs against a lethal intravenous injection of $HgCl_2$; the lack of effect of glutathione and cysteine*

Weight	$HgCl_2$	Antidote	Effect
Kg			
13.0	4 mg per kg intravenously	None	Dead in 1 day.
15.5			Dead in 10 days.
10.0			Dead in 4 days.
8.0			Survived.
10.5			Dead in 4 days.
8.0			Do.
8.0			Dead in 5 days.
14.0			Dead in 3 days.
7.0	4 mg per kg intravenously	Glutathione, 0.45 g per kg before Hg	Dead in 12 hours.
7.7			Dead in 14 hours.
7.0	4 mg per kg intravenously	Cysteine, 0.23 g per kg before Hg	Do.
13.6			Dead in 3 days.
10.0	4 mg per kg intravenously	Sulphoxylate, 0.7 g per kg just before Hg	Survived.
10.5			Do.
12.0			Do.
18.0			Do.
6.0			Do.

Experiments on dogs revealed that protection could be afforded from a lethal intravenous dose of bichloride if preceded by an injection of sulphoxylate. It was also possible to save a high percentage of dogs from a lethal oral dose of mercury if proper sulphoxylate therapy was instituted an hour or more after administration of the bichloride. All dogs were kept under observation for at least a week before use in the following experiments.

Five dogs were injected intravenously with 0.7 g of sulphoxylate (40 percent solution) per kilogram and shortly afterward were given intravenously 4 mg of bichloride per kilogram. All animals survived. Of 8 control animals receiving bichloride alone, 7 died (table 2).

Our observations were next extended to the treatment of dogs following the oral administration of bichloride. The fatal dose by mouth for dogs is stated by Hesse (13) to be 35 mg per kilogram of body weight. Haskell and Forbes (4) place it at 20 mg per kilogram in fasting dogs that have received morphine to prevent vomiting.

Eight dogs from whom food was withheld for 18 hours were given 20 mg of morphine sulphate per kilogram subcutaneously, to prevent vomiting, and in approximately one half hour 20 mg of bichloride of mercury (1 percent solution) per kilogram by stomach tube, washed in with twice the volume of water. To 4 of the dogs was given intravenously 0.5 g of sulphoxylate (20 percent solution) per kilogram 17 to 34 minutes after the mercury, and again at 4½ hours after. To the control dogs were given intravenously 3 cc of 0.8 percent sodium chloride per kilogram approximately 4 hours after the mercury. Three of the four control animals died. None of the treated dogs died (table 3).

TABLE 3.—*The protective action of sulphoxylate injected intravenously subsequent to an oral dose of 20 mg of $HgCl_2$ per kilogram to dogs*

Weight	$HgCl_2$	Antidote	Interval after $HgCl_2$	Effect
Kg				
9.3	20 mg per kilogram by mouth.	0.8% NaCl, 3 cc per kilogram intravenously.	4¼ hr	Died in 3 days.
12.5			4 hr	Survived.
20.7			3¾ hr	Died in 30 hours.
16.0			4¼ hr	Died in 14 days.
8.0	20 mg per kilogram by mouth.	Formaldehyde, sulphoxylate 0.5 g per kilogram intravenously.	30 min and 4½ hr	Survived.
11.6			20 min. and 4½ hr	Do.
11.1			34 min. and 4½ hr	Do.
9.0			17 min. and 4½ hr	Do.

Because of the depression produced by the above dose of morphine, an attempt was made to reduce the dosage to 10 to 15 mg per kilogram, but in some dogs this proved insufficient to produce quiescence and a further dose was required. It was also found more satisfactory to wait an hour after the morphine was given before administering the mercury. The animals were carefully watched for vomiting following oral administration of bichloride.

Three dogs received 35 mg of mercury per kilogram by mouth, followed by an intravenous injection of 0.5 g sulphoxylate (20 percent solution) in 30, 32, and 75 minutes; one dog survived. Three control dogs received a similar volume of salt solution (2.5 cc per kilogram) approximately 30 minutes after the mercury, with no survivals (table 4).

TABLE 4.—*Less beneficial effect of sulphoxylate given intravenously following a larger oral dose (25 to 35 mg per kilogram) of $HgCl_2$ to dogs*

Weight	$HgCl_2$	Antidote	Interval after $HgCl_2$	Effect
Kg				
12.5	35 mg per kilogram by mouth.	0.8% NaCl, 2.5 cc per kilogram intravenously.	½ hr	Died in 2 days.
14.0				Died in 1 hour.
24.0				Died in 3 days.
12.0	do	Sulphoxylate 0.5 g per kilogram intravenously.	32 min	Died in 4 days.
12.0			30 min	Died in 3 days.
11.4			75 min	Survived.
7.0	25 mg per kilogram by mouth.	do	70 min. and 5 hr	Died in 3 days.
14.0			60 min. and 6 hr	Died in less than 20 hours.
6.3			33 min. and 6 hr	Survived.

Seven dogs received 25 mg of bichloride per kilogram by mouth in the usual manner. Three of these animals were treated with two intravenous injections each of 0.5 g of sulphoxylate (20 percent) per kilogram. Two of the three died (table 4). Of four control dogs injected with equivalent volumes of salt solution at approximately the same intervals after the mercury, all died (table 5).

Of those animals that died following the administration of sulphoxylate by the intravenous route alone, histological examination of the kidneys by Dr. J. G. Pasternack, of this laboratory, revealed a strik-

ing difference between them and the control animals treated with salt solution. While the control animals showed extensive degenerative changes typical of acute mercurial nephritis, the treated animals showed only vascular congestion, and in some cases cloudy swelling and local round cell infiltration.

On the other hand, it was found in both control and treated animals that the mucous membrane of the stomach and upper portion of the small intestine showed extensive necrotic changes, in most cases presenting on gross examination a black surface of necrotic tissue.

In view of previous experiments showing that no appreciable amounts of sulphoxylate could be found in the alimentary canal following its intravenous injection, it was believed that the gastrointestinal damage produced locally by the bichloride might be an important factor in the death of those animals receiving only intravenous therapy.

Accordingly, 18 other dogs, after the usual preparation, were given 25 mg of bichloride per kg by mouth. Twelve of these animals received 0.5 gm sulphoxylate (10–20 percent solution) per kg intravenously, and at the same time 0.5 to 1.0 gm per kilo (5 percent solution) through stomach tube, from 1 to 1½ hours following the mercury. Nine of these 12 animals survived and seemed to escape the toxic effects of bichloride, except some gastrointestinal inflammation, with diarrhea, and in some cases bloody stools, for several days. This represents injury which occurred prior to the therapy. The stools shortly after the treatment take on a dark greyish-brown color, which is due to the presence of the reduced mercury, and give a positive test for sulphoxylate.

Of the three treated animals that succumbed, two died in so short a time that kidney damage could not be responsible for the death. One (19 kg) died in 11 hours and showed at autopsy one lung partly consolidated and filled with a bloody serous fluid, while the other lung was normal; aspiration into the lung was an important factor in this fatality. The second dog (6.6 kg) was found dead the following morning (within 18 hours). Autopsy revealed extensive necrosis of the gastric mucosa and inflammation throughout the intestinal mucosa, while the kidneys histologically showed only diffuse cloudy swelling and vascular engorgement. The third dog (20 kg) lived for 8 days but refused all food during this time. Bloody stools and elevation of the blood nonprotein nitrogen were present during this period. Autopsy, however, showed no significant renal lesions on gross and histological examination. Pregnancy of about 1 month's development was found to be present.

The 6 control animals received 0.8 percent salt solution by mouth and intravenously in equivalent volume to that of sulphoxylate at approximately the same time after the mercury; 5 of the 6 died within

4 days. Another group of 4 dogs received this dose of bichloride by mouth and intravenous salt solution as therapy, with no survivals (table 5).

TABLE 5.—*The protection of dogs against an oral dose of 25 mg of $HgCl_2$ per kg when sulphoxylate is administered both by mouth and intravenously up to 90 minutes after the $HgCl_2$*

Weight	$HgCl_2$	Antidote	Interval after $HgCl_2$	Effect
Kg				
8.2	25 mg per kg by mouth.	0.8% NaCl, 2.5 cc per kg intravenously.	1 hr. 7 min. and 5½ hr.	Died in 4 days.
14.1			1 hr., 6 hr.	Died in 2 days.
8.2			do.	Died in 20 days.
12.1			40 min., 6 hr.	Died in 2 days.
16.0	do.	0.8% NaCl, 2.5 cc per kg intravenously and 5.0 cc per kg by mouth.	1 hr. 7 min.	Died in 4 days.
12.5			1 hr. 5 min.	Survived.
20.0			1 hr. 3 min.	Died in 3 days.
5.7			1 hr. 5 min.	Died in 2 days.
7.0			1 hr. 10 min.	Died in 1 day.
9.0			1 hr. 17 min.	Died in 2 days.
6.6	do.	20% sulphoxylate, 0.5 g per kg intravenously and 1.0 g per kg by mouth.	1 hr. 20 min.	Died during night.
10.5			1 hr. 10 min.	Survived.
7.4			1 hr. 7 min.	Do.
6.7			1 hr.	Do.
18.0			40 min.	Do.
7.4	do.	10% sulphoxylate, 0.5 g per kg intravenously and 1.0 g per kg by mouth.	1 hr. 5 min.	Do.
9.5			1 hr. 10 min.	Do.
19.0			1 hr. 30 min.	Do.
20.0			1 hr.	Died in 8 days.
19.0			1 hr. 15 min.	Died in 11 hours.
7.6			1 hr.	Survived.
8.4			1 hr. 10 min.	Do.

Determinations of blood nonprotein nitrogen were made upon these animals to obtain evidence of functional damage to the kidneys. Results upon the 12 animals treated with sulphoxylate showed in the 9 survivors no elevation of the nonprotein nitrogen throughout the period of observation, which extended up to 8 weeks. Two died before determinations could be made, while the dog that died in 8 days showed marked elevation up to the time of death (chart 5).

Of the 6 control dogs whose nonprotein nitrogen was studied, 4 showed striking increases up to the time of death. The fifth dog died before a determination could be made, while the sixth, the survivor in this group, showed only a slight increase (chart 5). Vomiting, which was not detected, probably occurred in this animal as a basis for the slight toxic effects.

DISCUSSION

The favorable results of sulphoxylate therapy in dogs following oral intoxication with mercuric chloride suggest the usefulness of such treatment in human cases. Intravenous injections have been found to afford protection from kidney damage, while oral administration, by the reaction with the unabsorbed mercury to form insoluble and less toxic compounds, can undoubtedly give some local protection and also inhibit further absorption of mercury. The evidence obtained from rats and rat tissues indicates that after the mercury has combined with the cell protoplasm, no benefit is obtained from the use

of sulphoxylate. Considerable time is no doubt required after an oral dose of mercury before the full damage to the kidneys occurs. The length of time beyond that established by our experiments after which sulphoxylate therapy will be of benefit, remains to be determined.

Our experiments have established the low toxicity of sulphoxylate to animals. While small amounts are injected intravenously into human beings as an impurity in neoarsphenamine (up to 25 percent (14)), the injection into human beings of doses comparable to those employed in our animals has not heretofore been attempted. Because of the fact that strong solutions are irritating when injected subcutaneously, it cannot be administered in this manner.

We have had occasion up to the time of this report to try this therapy in only one human case.[3] This case is reported here primarily

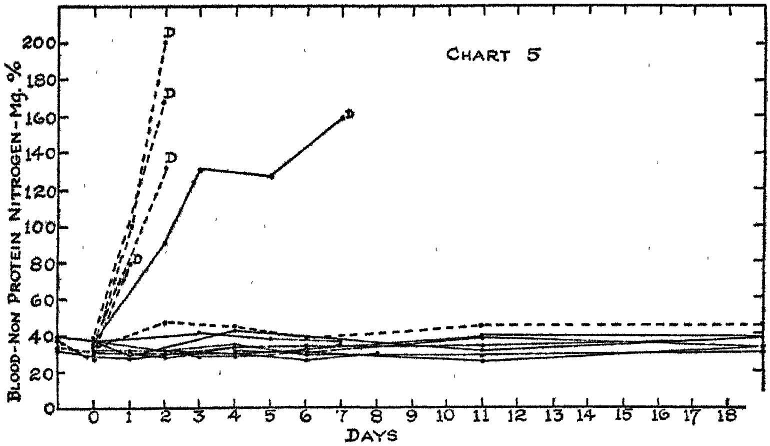

CHART 5.—The ability of sulphoxylate to protect dogs from kidney damage following $HgCl_2$. The non-protein nitrogen in the blood of 5 control dogs and of 10 dogs treated with sulphoxylate; all received a lethal dose of $HgCl_2$ (25 mg per kilo) by mouth. Interrupted lines, control dogs receiving 0.8 percent NaCl as treatment. Continuous lines, dogs treated with sulphoxylate.

to demonstrate that large doses of sulphoxylate can also be tolerated by human beings without ill effects.

A man (C. L.), age 26, weight 52 kg (114 pounds), took four ½-gram tablets of mercuric chloride with suicidal intent. Vomiting did not occur until approximately 1½ hours later, and treatment was instituted at the hospital approximately 2 hours after the bichloride had been taken. His stomach was washed with 5 percent sulphoxylate. The washings showed considerable quantities of the dark gray reduced mercury. Three hundred cc of 5 percent sulphoxylate were left in the stomach; 250 cc of 10 percent sulphoxylate were then administered intravenously, the injection being slowly given over a period of 40 minutes. Vomiting occurred toward the end of the

[3] Since this was written we have treated 5 additional acute cases. All recovered without renal or intestinal lesions.

injection, due either to the treatment or to the mercury. A sample of blood was taken 20 minutes after the injection. The serum showed a strongly positive nitroprusside test for sulphoxylate; and upon the addition of 0.2 percent mercuric chloride, a grayish black precipitate was immediately formed. Following the therapy the patient had no symptoms other than abdominal discomfort. During the next day bloody stools were passed. Recovery was uneventful, with no albumin appearing in the urine and no elevation of the blood nonprotein nitrogen.

While the question of most suitable dosage in human beings remains to be established, we would suggest in the average case the following technique: Oral therapy of 10 to 15 g by stomach tube as described above, followed by 10 g of sulphoxylate as a 5 or 10 percent solution given intravenously, allowing at least 15 minutes for the injection, and a repetition of an intravenous dose of 5–10 g in 3 hours. The solutions for intravenous injection should be freshly prepared, and the sulphoxylate for this purpose should be a purified and recrystallized product. Sodium formaldehyde sulphoxylate can be obtained from manufacturers of neoarsphenamine.

It is not possible at present to say whether subsequent therapy will be of benefit in delayed symptoms of acute poisoning, or whether it will be of benefit in cases of chronic mercurialism.

In view of the ability of dilute solutions of sulphoxylate to reduce rapidly mercuric chloride to insoluble and less toxic mercurous compounds and to metallic mercury, its beneficial action in acute intoxication may be explained by its stability in the body and by the fact that intravenous injections confer upon the body fluids the power strongly to reduce mercuric salts. Thus it can persist unchanged throughout the alimentary canal following oral doses; it can remain for several hours in the blood following intravenous injections, in amounts capable of rapidly reducing added mercuric chloride; it can appear unchanged in the urine in considerable quantities, indicating that a concentration of this substance occurs in the kidney cells.

The observation that sodium thiosulphate can antagonize the action of mercury upon some tissues only under certain conditions and that it can afford no protection to kidney tissue should serve to delineate more clearly its field of use in the treatment of mercurialism.

SUMMARY

The ability of certain compounds to influence the toxicity of mercuric chloride has been studied by measuring the oxygen consumption of excised rat tissues. Sodium thiosulphate protected the rat testes against the action of mercury if added before the mercury, but not at all if the mercury was added first. With the liver, protection was observed when the thiosulphate was added either before or just after

the mercury. With the kidney, no protection could be observed in any case, whether the thiosulphate was added before or after. Injected along with bichloride subcutaneously into rabbits' ears, thiosulphate prevented the local inflammatory reaction of bichloride. Injected intravenously into rats, thiosulphate did not protect against a subsequent lethal injection of mercury.

Glutathione was able to counteract the toxic action of bichloride on the oxygen consumption of rat tissues, including kidney, when added either before or up to one-half hour after the addition of mercury. Glutathione prevented the local inflammatory reaction of bichloride when injected subcutaneously along with it. Glutathione saved 10 of 12 rats when injected intravenously previous to a lethal dose of bichloride. Eleven of twelve rats were also saved when the glutathione was injected one-half hour after the bichloride. Glutathione did not protect two dogs when injected previous to a lethal intravenous dose of bichloride. Similar results were obtained upon two dogs with cysteine.

Formaldehyde sulphoxylate counteracted the effect of mercuric chloride on the oxygen consumption of rat tissues if added before the bichloride, but not if added subsequently. Likewise, on rats injected intravenously with fatal doses of bichloride, 5 of 7 were saved if sulphoxylate was injected previously, but none of 10 if injected 25 minutes following the mercury.

Upon dogs the following results with sulphoxylate were obtained: Five dogs received an intravenous injection of sulphoxylate prior to the injection of a fatal dose of bichloride; all survived. Of 8 control animals, 7 died. Of 4 dogs receiving 20 mg of bichloride per kg by mouth, and 2 intravenous injections of sulphoxylate subsequently (after 17 and 34 minutes, and again after 4½ hours), all survived. Of 4 control animals, 1 survived. Six dogs received 25 to 35 mg of bichloride per kg by mouth and intravenous injections of sulphoxylate subsequently. Two of these animals survived, while none of six controls survived. Twelve dogs received 25 mg of bichloride per kg by mouth and both oral and intravenous doses of sulphoxylate 40 to 90 minutes later; 9 of the 12 survived. Of a total of 10 control dogs receiving this dose of bichloride and intravenous and oral salt solution as therapy, 9 died. Nonprotein nitrogen determinations made subsequent to the intoxication on the treated dogs showed no elevation in 9 of 10 animals, while marked rises occurred in the control animals.

One human case of bichloride poisoning received intravenously 0.5 gm of sulphoxylate per kilogram of body weight and approximately 15 grams by stomach tube with no ill effects. Recovery without renal damage occurred in this case.

20288°—34——2

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COURT DECISION RELATING TO PUBLIC HEALTH

Order of local manager of health and charity prohibiting sale of unpasteurized milk and cream held invalid where ordinance permitted such sale.—(Colorado Supreme Court; *City and County of Denver et al.* v. *Gibson et al.*, 24 P. (2d) 751; decided July 3, 1933.) Under the provisions of the milk ordinance of Denver it was lawful for licensed dairymen to sell raw milk and cream of a certain standard in Denver. Section 4 of this ordinance authorized the manager of health and charity to formulate such regulations, not inconsistent with the ordinance, as were necessary to procure a standard of milk required by the ordinance. Purporting to act pursuant to such section 4, the manager of health and charity issued an order to the effect that after a certain date it would be unlawful to sell unpasteurized milk or cream. Suit to enjoin the enforcement of this order was brought by persons licensed to sell their dairy products in Denver, and the lower court granted an injunction. The case was taken to the supreme court, which body, in affirming the judgment of the trial court, said that "The conclusion is inevitable that the manager of health and charity assumed a legislative function and promulgated an order in derogation of an existing ordinance." The appellate tribunal quoted with approval the following language used by the trial judge:

* * * The ordinance permits the sale of milk, both raw and pasteurized, and establishes certain specific scientific standards therefor. Can the manager, in

effect, repeal the ordinance by an attempt to "ordain", as he has done by the express terms of the order, that it shall be unlawful to sell milk and cream on and after February 1, 1930, unless the same has been pasteurized, which directly contradicts the express terms of the ordinance? * * * My conclusion in the present case is that * * * the manager of health and charity was and is without power to make and enforce the order mentioned.

DEATHS DURING WEEK ENDED DECEMBER 9, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Dec. 9, 1933	Correspond-ing week 1932
Data from 85 large cities of the United States:		
Total deaths	8,565	8,644
Deaths per 1,000 population, annual basis	12.0	12.3
Deaths under 1 year of age	620	607
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	53	51
Deaths per 1,000 population, annual basis, first 49 weeks of year	10.9	11.1
Data from industrial insurance companies:		
Policies in force	67,326,257	69,666,314
Number of death claims	13,845	13,381
Death claims per 1,000 policies in force, annual rate	10.7	10.0
Death claims per 1,000 policies, first 49 weeks of year, annual rate	9.8	9.5

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Dec. 16, 1933, and Dec. 17, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 16, 1933, and Dec. 17, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 16, 1933	Week ended Dec. 17, 1932	Week ended Dec. 16, 1933	Week ended Dec. 17, 1932	Week ended Dec. 16, 1933	Week ended Dec. 17, 1932	Week ended Dec. 16, 1933	Week ended Dec. 17, 1932
New England States:								
Maine	3	3	15	-------	1	-------	0	0
New Hampshire	1	1	-------	-------	12	1	0	0
Vermont	3	2	-------	-------	59	-------	0	0
Massachusetts [1]	26	40	-------	10	482	110	1	1
Rhode Island	2	4	-------	1	9	-------	1	0
Connecticut	10	5	4	13	17	13	0	0
Middle Atlantic States:								
New York	54	49	[2] 28	[2] 45	584	715	8	8
New Jersey	25	41	20	32	99	230	0	0
Pennsylvania	51	92	-------	-------	327	208	8	2
East North Central States:								
Ohio	65	78	101	644	120	203	3	8
Indiana	65	67	61	1,078	30	24	2	2
Illinois	52	80	11	167	34	54	4	11
Michigan	26	31	4	57	37	271	0	8
Wisconsin	13	13	17	111	161	222	3	0
West North Central States:								
Minnesota	8	6	-------	10	8	84	1	3
Iowa [3]	18	27	1	-------	30	8	1	0
Missouri	80	26	6	184	112	14	2	4
North Dakota	10	9	2	-------	33	120	1	0
South Dakota	22	20	-------	17	217	2	0	0
Nebraska	6	35	-------	26	13	1	1	1
Kansas	29	28	1	41	43	6	0	2
South Atlantic States								
Delaware	1	4	-------	1	1	1	1	0
Maryland [3]	25	26	20	171	21	6	0	1
District of Columbia	10	5	1	64	25	-------	1	2
Virginia	67	39	-------	-------	87	147	0	0
West Virginia	47	25	14	62	6	88	2	4
North Carolina	60	38	14	192	503	49	2	0
South Carolina [1]	14	12	459	1,446	125	11	0	0
Georgia [1]	35	36	-------	3,954	299	-------	1	0
Florida	22	23	8	38	-------	1	1	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 16, 1933, and Dec. 17, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 16, 1933	Week ended Dec. 17, 1932	Week ended Dec. 16, 1933	Week ended Dec. 17, 1932	Week ended Dec. 16, 1933	Week ended Dec. 17, 1932	Week ended Dec. 16, 1933	Week ended Dec. 17, 1932
East South Central States:								
Kentucky	60	29	25	2,537	4		1	1
Tennessee	44	25	113	3,767	269	5	1	2
Alabama [1]	33	27	47	7,034	114	3	1	2
Mississippi [3]	19	6					0	1
West South Central States:								
Arkansas	18	13	32	4,272	294	1	0	0
Louisiana [1]	30	26	11	4,945	1		0	2
Oklahoma [4]	70	29	53	2,305	39	2	0	0
Texas [1]	207	104	143	498	193	232	0	0
Mountain States:								
Montana	7	1	5	1,388	2	449	2	1
Idaho		5		9	10	5	0	1
Wyoming				101	34	17	0	0
Colorado	12	6		313	4	8	0	0
New Mexico	10	10		8	74	1	0	0
Arizona	5	5	20	174	3		0	1
Utah [3]		2	2	21	129		1	1
Pacific States:								
Washington	6	2	3	1	219	5	0	0
Oregon	1	1	17	769	18	45	0	1
California	32	64	48	1,271	137	27	3	1
Total	1,404	1,220	1,301	37,777	5,048	3,384	43	57

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 16, 1933	Week ended Dec. 17, 1932	Week ended Dec. 16, 1933	Week ended Dec. 17, 1932	Week ended Dec. 16, 1933	Week ended Dec. 17, 1932	Week ended Dec. 16, 1933	Week ended Dec. 17, 1932
New England States:								
Maine	0	0	10	31	0	0	1	0
New Hampshire	1	0	12	21	0	0	1	0
Vermont	0	0	15	11	0	0	3	0
Massachusetts [1]	0	2	222	360	0	0	3	7
Rhode Island	0	0	17	34	0	0	1	0
Connecticut	0	0	63	63	0	0	0	2
Middle Atlantic States:								
New York	7	1	466	594	0	3	8	8
New Jersey	1	3	146	213	0	0	5	5
Pennsylvania	1	6	418	651	0	0	12	7
East North Central States:								
Ohio	4	2	553	550	2	8	7	21
Indiana	1	0	183	118	4	5	4	4
Illinois	1	0	379	391	3	2	7	11
Michigan	1	0	293	297	0	0	11	6
Wisconsin	1	2	101	84	64	1	0	1
West North Central States:								
Minnesota	0	0	100	73	3	0	2	0
Iowa [3]	0	0	87	47	1	64	4	0
Missouri	0	0	131	76	3	0	1	1
North Dakota	0	2	34	12	0	0	1	0
South Dakota	0	0	11	10	0	1	0	2
Nebraska	0	0	28	50	2	3	5	0
Kansas	0	1	115	88	7	1	5	0
South Atlantic States:								
Delaware	1	0	6	11	0	0	1	0
Maryland [3]	0	0	80	100	0	0	9	7
District of Columbia	0	0	14	12	0	0	1	0
Virginia	0	0	128	78	0	0	16	18
West Virginia	0	0	144	69	0	0	7	5
North Carolina	0	1	131	77	1	0	6	[illegible]
South Carolina [1]	0	0	21	13	0	2	[illegible]	[illegible]
Georgia [1]	3	2	27	22	0	0	[illegible]	[illegible]
Florida	0	0	5	8	0	0	[illegible]	[illegible]

See footnote at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 16, 1933, and Dec. 17, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 16, 1933	Week ended Dec. 17, 1932	Week ended Dec. 16, 1933	Week ended Dec. 17, 1932	Week ended Dec. 16, 1933	Week ended Dec. 17, 1932	Week ended Dec. 16, 1933	Week ended Dec. 17, 1932
East South Central States:								
Kentucky	0	0	114	40	0	1	5	7
Tennessee	0	2	129	39	2	19	6	12
Alabama [1]	1	0	37	20	0	1	4	0
Mississippi [3]	1	0	25	12	3	1	0	1
West South Central States:								
Arkansas	0	0	15	23	2	2	3	5
Louisiana [1]	1	0	14	12	30	0	15	14
Oklahoma [4]	1	0	47	34	0	4	5	0
Texas [1]	0	0	122	82	12	7	35	6
Mountain States:								
Montana	0	0	15	10	18	0	2	1
Idaho	0	0	8	4	1	1	0	1
Wyoming	0	0	12	13	0	0	0	0
Colorado	0	0	19	25	3	0	8	0
New Mexico	0	0	33	18	0	0	6	1
Arizona	0	0	13	5	0	0	1	1
Utah [3]	0	0	10	25	11	0	0	0
Pacific States:								
Washington	4	0	37	44	2	22	3	0
Oregon	1	0	44	20	9	7	2	2
California	6	3	205	111	8	1	20	8
Total	87	27	4,831	4,701	191	156	255	17

[1] Typhus fever, week ended Dec. 16, 1933, 54 cases, as follows: Massachusetts, 1; South Carolina, 15 Georgia, 22; Alabama, 12; Louisiana, 1, Texas, 17.
[2] New York City only.
[3] Week ended earlier than Saturday.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
October 1933										
Vermont		2			3			50	0	1
November 1933										
District of Columbia	2	89	8		49	1	0	58	0	17
Indiana	8	507	216		93		3	875	16	7
Maine	1	13	2		9		8	48	0	12
Michigan	6	116	7	4	170		3	1,169	3	39
Minnesota	2	80	2		127		19	301	15	15
Nebraska		39	27		32		5	175	24	5
New Hampshire		3					2	85	0	0
New Jersey	5	117	71	1	130		4	509	0	21
New Mexico	1	42	16	81	99	1	2	102	0	65
North Carolina	10	529	82		896	22	6	840	1	24
Ohio	3	426	256	2	402		16	2,287	4	44
Tennessee	4	310	186	391	574	7	6	539	9	75
Texas	1	1,281	578		71	45	8	381	31	175
Vermont		12			161		3	52	0	0

October 1933	Cases
Vermont:	
Chicken pox	71
Mumps	23
Undulant fever	1
Whooping cough	83
November 1933	
Anthrax:	
Texas	1
Chicken pox:	
District of Columbia	43
Indiana	590
Maine	269
Michigan	1,561
Minnesota	1,121
Nebraska	297
New Jersey	910
New Mexico	28
North Carolina	295
Ohio	2,298
Tennessee	63
Texas	105
Vermont	278
Conjunctivitis:	
New Mexico	5
Dengue:	
Texas	6
Diarrhea and enteritis:	
Ohio (under 2 years)	17
Dysentery:	
Michigan	26
Minnesota (amoebic)	24
Minnesota (bacillary)	2
New Jersey (amoebic)	8
New Mexico	5
Ohio	19
Tennessee	5
Texas	45
Food poisoning:	
New Mexico	1
Ohio	13
German measles:	
Maine	8
Michigan	34
New Jersey	10
New Mexico	11
North Carolina	8
Ohio	17
Tennessee	2
Impetigo contagiosa:	
Tennessee	17
Jaundice, spirochetal:	
Michigan	8

Lead poisoning:	Cases
Ohio	21
Lethargic encephalitis:	
District of Columbia	1
Indiana	3
Maine	1
Michigan	5
Minnesota	5
Nebraska	1
New Jersey	5
New Mexico	1
Ohio	8
Tennessee	5
Texas	9
Mumps:	
Indiana	24
Maine	17
Michigan	284
Nebraska	27
New Jersey	164
New Mexico	21
Ohio	108
Tennessee	41
Texas	25
Vermont	23
Ophthalmia neonatorum:	
New Jersey	3
Ohio	75
Tennessee	1
Texas	1
Paratyphoid fever:	
Michigan	3
Minnesota	2
Ohio	1
Tennessee	2
Texas	3
Puerperal septicemia:	
New Mexico	2
Ohio	5
Tennessee	2
Rabies in animals:	
Indiana	27
New Jersey	12
Rabies in man:	
Ohio	1
Rocky Mountain spotted fever:	
North Carolina	1
Scabies:	
Tennessee	4
Septic sore throat:	
Maine	1
Michigan	59
Nebraska	2

	Cases
North Carolina	12
Ohio	211
Tennessee	18
Vermont	1
Tetanus:	
Michigan	1
Minnesota	1
Ohio	1
Tennessee	1
Texas	1
Trachoma:	
New Jersey	1
Ohio	2
Tennessee	13
Texas	6
Trichinosis:	
New Jersey	2
Tularaemia:	
Michigan	5
Minnesota	6
Ohio	7
Texas	1
Typhus fever:	
North Carolina	5
Texas	29
Undulant fever:	
Indiana	1
Maine	2
Michigan	4
Minnesota	12
Nebraska	1
New Jersey	1
Ohio	6
Tennessee	2
Texas	11
Vincent's infection:	
Maine	2
Michigan	24
Tennessee	2
Whooping cough:	
District of Columbia	56
Indiana	119
Maine	213
Michigan	834
Minnesota	233
Nebraska	279
New Jersey	485
New Mexico	96
North Carolina	530
Ohio	861
Tennessee	120
Texas	277
Vermont	210

WEEKLY REPORTS FROM CITIES

City reports for week ended Dec. 9, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	0	10	5	0	1	0	3	27
New Hampshire:											
Concord	0	------	0	0	0	0	0	0	0	0	6
Manchester	0	------	0	0	1	3	0	1	0	0	15
Nashua	0	------	0	0	0	3	0	0	0	0	0
Vermont:											
Barre	0	------	0	66	0	0	0	1	0	0	8
Burlington	1	------	0	0	0	1	0	0	0	2	9
Massachusetts:											
Boston	7	------	0	146	29	46	0	6	0	59	217
Fall River	8	------	0	2	2	0	0	0	2	0	25
Springfield	0	1	1	0	3	1	0	0	0	16	36
Worcester	1	------	0	348	9	11	0	1	2	16	49
Rhode Island:											
Pawtucket	0	------	0	0	0	3	0	0	0	0	0
Providence	0	------	0	0	5	9	0	4	0	28	62
Connecticut:											
Bridgeport	0	------	0	5	2	7	0	1	0	3	34
Hartford	1	------	0	1	1	11	0	1	0	2	41
New Haven	0	------	0	0	1	4	0	0	0	2	45

City reports for week ended Dec. 9, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
New York:											
Buffalo											
New York	37	22	13	29	163	130	0	83	6	101	1,512
Rochester	0		1	0	9	9	0	0	0	7	73
Syracuse	0		0	0	5	4	0	0	0	68	55
New Jersey:											
Camden	2	-	0	2	4	12	0	2	0	1	36
Newark	1	4	2	3	7	10	0	7	1	25	100
Trenton	0	-	1	0	5	8	0	0	0	0	40
Pennsylvania:											
Philadelphia	2	14	6	120	66	74	0	24	0	27	551
Pittsburgh	7	4	3	4	10	31	0	4	1	36	146
Reading	0	-	0	1	5	1	0	0	0	15	33
Ohio:											
Cincinnati	14	-	1	46	6	26	0	7	0	15	128
Cleveland	9	44	3	1	35	71	0	4	2	78	192
Columbus	5	-	0	0	7	43	0	1	0	0	83
Toledo	2	1	1	34	6	38	0	7	0	9	80
Indiana:											
Fort Wayne	7	-	0	0	2	8	0	1	0	6	23
Indianapolis	5	-	0	1	8	7	0	0	0	18	-
South Bend	0	-	0	0	3	4	0	0	0	3	11
Terre Haute	3	-	0	9	1	2	0	0	0	0	22
Illinois:											
Chicago	1	5	3	10	76	151	0	38	2	112	746
Springfield	2	2	0	0	2	6	0	0	0	1	20
Michigan:											
Detroit	9	4	5	20	32	62	0	8	0	82	269
Flint	0	-	0	3	3	27	0	1	0	3	33
Grand Rapids	0	-	1	0	1	4	0	0	0	0	25
Wisconsin:											
Kenosha	0	-	0	0	2	17	0	0	0	4	15
Madison	0	-	-	1	-	1	0	-	0	33	6
Milwaukee	11	-	0	5	8	20	1	8	0	62	86
Racine	0	-	0	3	0	8	0	0	0	4	15
Superior	0	-	0	1	0	0	0	0	0	2	5
Minnesota:											
Duluth	0	-	1	0	0	3	0	0	0	0	23
Minneapolis	3	-	0	5	11	12	0	2	1	30	104
St. Paul	0	1	1	1	3	14	0	3	1	19	52
Iowa:											
Des Moines	2	-	-	0	-	31	0	-	0	0	21
Sioux City	2	-	-	0	-	1	0	-	0	3	-
Waterloo	0	-	-	1	-	0	0	-	0	6	
Missouri:											
Kansas City	5	-	1	2	7	30	0	5	0	6	139
St. Joseph	3	-	0	0	3	2	0	0	0	0	18
St. Louis	22	-	-	59	12	23	0	8	4	53	185
North Dakota:											
Fargo	0	-	0	8	0	0	0	0	0	0	0
Grand Forks	0	-	0	0	0	0	0	0	0	1	0
South Dakota:											
Aberdeen	0	-	0	0	0	1	0	0	0	0	0
Sioux Falls	0	-	0	118	0	0	0	0	0	0	7
Nebraska:											
Lincoln	0	-	0	1	0	4	1	0	0	1	0
Omaha	2	-	0	8	2	14	1	0	0	8	52
Kansas.											
Topeka	0	-	0	0	0	5	0	0	0	5	4
Wichita	0	-	0	0	5	6	0	3	0	10	34
Delaware:											
Wilmington	0	-	0	0	2	1	0	2	0	2	30
Maryland:											
Baltimore	6	16	3	2	25	22	0	7	1	53	227
Cumberland	1	-	0	0	1	6	0	0	0	0	6
Frederick	0	-	0	0	2	3	0	0	0	0	2
District of Columbia.											
Washington	9	2	0	31	13	17	0	13	2	20	167
Virginia:											
Lynchburg	5	-	0	0	1	6	0	0	0	0	10
Norfolk	2	-	0	1	0	9	0	0	[1] 1	0	38
Richmond	7	-	1	0	6	11	0	3	1	0	53
Roanoke	3	-	0	0	1	6	0	0	0	0	11

[1] Nonresident.

City reports for week ended Dec. 9, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
West Virginia:											
Charleston	6	------	0	0	3	2	0	1	0	0	27
Huntington	6	------	0	0	0	14	0	0	0	0	0
Wheeling	0	------	0	0	2	4	0	0	0	0	17
North Carolina:											
Raleigh	1	------	0	0	1	2	0	0	0	1	23
Wilmington	0	------	0	0	0	6	0	0	0	0	11
Winston-Salem	6	------	0	153	4	8	0	2	0	0	20
South Carolina:											
Charleston	0	15	0	2	0	1	0	3	2	6	27
Columbia	------	------	------	------	------	------	------	------	------	------	------
Greenville	1	------	0	0	3	1	0	0	0	2	10
Georgia:											
Atlanta	12	24	1	3	10	6	0	3	0	3	79
Brunswick	0	------	0	0	0	0	0	0	0	6	4
Savannah	0	27	0	0	1	2	0	3	3	0	29
Florida:											
Miami	1	1	1	0	0	1	0	2	0	0	30
Tampa	4	2	2	0	3	3	0	0	0	0	32
Kentucky:											
Ashland	2	------	------	0	------	2	0	------	0	0	------
Lexington	2	------	0	0	1	0	0	2	1	6	15
Louisville	14	------	0	0	5	17	0	2	0	8	67
Tennessee:											
Memphis	6	------	2	4	9	13	0	4	0	10	98
Nashville	1	------	0	12	4	0	0	2	1	0	------
Alabama:											
Birmingham	10	2	1	1	4	10	0	3	0	0	61
Mobile	3	------	0	0	3	1	0	1	0	0	21
Montgomery	1	2	------	0	------	1	0	------	0	0	------
Arkansas:											
Fort Smith	2	------	------	0	------	4	0	------	0	2	------
Little Rock	1	------	0	3	6	6	0	1	0	0	7
Louisiana:											
New Orleans	10	11	5	0	20	11	0	11	4	0	160
Shreveport	1	------	0	0	1	2	0	1	0	0	19
Oklahoma:											
Tulsa	1	------	------	7	------	1	0	------	0	0	------
Texas:											
Dallas	21	3	3	0	14	5	1	3	2	4	72
Fort Worth	8	------	1	0	9	15	0	0	0	0	39
Galveston	3	------	0	0	3	3	0	1	1	0	20
Houston	29	------	0	0	11	8	0	7	0	0	75
San Antonio	4	------	1	0	6	6	0	1	1	0	57
Montana:											
Billings	0	------	0	0	0	0	0	0	0	0	6
Great Falls	0	------	0	0	0	1	0	0	1	2	10
Helena	0	------	0	0	0	0	0	0	0	0	5
Missoula	0	------	0	0	1	0	0	0	0	0	11
Idaho:											
Boise	0	------	0	0	0	0	1	0	0	0	0
Colorado:											
Denver	3	37	1	3	11	9	0	4	0	37	92
Pueblo	0	------	0	0	1	0	0	0	0	10	7
New Mexico:											
Albuquerque	0	------	0	0	1	2	0	2	0	1	10
Utah:											
Salt Lake City	0	------	0	227	4	6	0	2	2	12	34
Nevada:											
Reno	0	------	0	0	1	0	0	0	0	0	5
Washington:											
Seattle	0	------	------	0	8	5	0	5	0	54	80
Spokane	0	2	2	136	5	2	0	1	0	2	32
Tacoma	1	------	0	0	2	2	0	1	0	7	25
Oregon:											
Portland	0	------	0	2	6	20	0	3	0	2	78
Salem	0	2	0	1	0	0	0	0	0	6	0
California:											
Los Angeles	21	24	1	8	20	75	3	27	2	51	354
Sacramento	1	------	0	16	6	1	0	2	0	1	26
San Francisco	2	4	2	0	10	9	0	9	0	9	195

City reports for week ended Dec. 9, 1938—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Kansas:			
Fall River	0	0	1	Topeka	1	0	0
New York:				West Virginia:			
New York	7	4	2	Wheeling	1	0	0
Pennsylvania:				North Carolina:			
Philadelphia	0	1	0	Wilmington	0	1	0
Ohio:				Georgia:			
Cleveland	1	1	2	Atlanta	1	1	0
Toledo	1	0	0	Washington:			
Indiana:				Seattle	0	0	2
Indianapolis	2	0	0	California:			
Illinois:				Los Angeles	1	0	0
Chicago	1	1	0	San Francisco	0	0	1
Iowa:							
Des Moines	0	0	1				

Lethargic encephalitis.—Cases: New York, 1; Chicago, 1; St. Louis, 5; Topeka, 1; Richmond, Va., 1; Birmingham, 1; Dallas, Tex., 1; Portland, Oreg., 1.

Typhus fever.—Cases: New York, 1; Charleston, S.C., 1; Atlanta, 3; Savannah, 3; Dallas, 1; Fort Worth, Tex., 1.

Pellagra.—Cases: Baltimore, 1; Washington, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended December 2, 1933.—During the 2 weeks ended December 2, 1933, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta [1]	British Columbia	Total
Cerebrospinal meningitis					1	1	1	1	2	6
Chicken pox		6	3	423	550	166	128	26	152	1, 454
Diphtheria		3	1	56	39	33	1	1		134
Dysentery				1	1		1		1	4
Erysipelas				9	7	2	1		1	20
Influenza		15		13	11				39	78
Lethargic encephalitis							1			1
Measles				112	22		34	1	7	176
Mumps					130	7	1	1	78	217
Paratyphoid fever	1									1
Pneumonia		1			36		5		11	53
Poliomyelitis				1	1					2
Scarlet fever		23	12	163	231	80	12	1	130	652
Smallpox				1						1
Trachoma				1	1	2				4
Tuberculosis	5	2	10	129	77	44	6		47	320
Typhoid fever			4	53	21		1		2	81
Whooping cough		11	3	259	120	154	41	5	23	616

[1] No report was received from Alberta for the week ended Dec. 2, 1933.

Ontario Province—Communicable diseases—Four weeks ended November 25, 1933.—The Department of Health of the Province of Ontario, Canada, reports certain communicable diseases for the 4 weeks ended November 25, 1933, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	3	1	Pneumonia		138
Chicken pox	908		Poliomyelitis	3	
Diphtheria	56	3	Puerperal septicemia		1
Dysentery	1		Scarlet fever	449	
Erysipelas	13	1	Septic sore throat	5	
German measles	14		Syphilis	81	1
Gonorrhea	116		Tetanus	1	
Influenza	15	2	Tuberculosis	164	26
Lethargic encephalitis	1		Tularaemia	1	
Measles	77		Typhoid fever	45	1
Mumps	175		Undulant fever	6	
Paratyphoid fever	7		Whooping cough	285	3

JAMAICA

Communicable diseases—Four weeks ended December 2, 1933.—During the 4 weeks ended December 2, 1933, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox	2	9	Lethargic encephalitis		2
Diphtheria		2	Puerperal fever		2
Dysentery	9	15	Tuberculosis	38	77
Erysipelas		8	Typhoid fever	16	74
Leprosy		1			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Apr. 30–May 27, 1933	May 28–June 24, 1933	June 25–July 29, 1933	July 30–Aug. 26, 1933	Week ended— September 1933 2	9	16	23	30	October 1933 7	14	21	28	November 1933 4	11	18	25	Dec. 2, 1933
China:																			
Canton	C			1															
Hankow	C	2	1	2			1												
	D	1		1	1														
Swatow	C	2																	
Tientsin	C			4															
India	C	8,201	3,517	6,881	7,695	2,901	2,576	2,534	3,427	2,984	2,211	2,091							
	D	4,091	1,555	3,047	3,237	1,315	1,166	1,233	1,502	1,438	1,097	943							
Bombay Presidency	C			3,869	3,604	681	610	532	642	646	407		421	548	352				
	D			1,609	1,436	305	282	259	301	265	199		169	266	175				
Bombay	C	2	1	6	1				1	4	1			3	1				4
Calcutta	C	690	196	77	59	21	28	23	12	9	26	15	11	16	13	11		18	10
Chittagong	C	21	7		1							1							1
Madras Presidency	C			276	923	274	213	182	247	142	142	90	155						
	D			74	338	126	94	79	91	54	46	51	68						
Madras	C													4	1		2	3	61
	D													1	2			2	26
Moulmein	C		3																
Rangoon	C	1	1	2															
Vizagapatam	C	1		4									1						
India (French):																			
Chandernagor	D									2									
Karikal	C									1									
	D									1									
Pondichery	C					1				1									
	D					1				1									
Indo-China (see also table below):																			
Pnom-Penh	C	2	1																
Saigon and Cholon	C			8	2														

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—*Continued*

[C indicates cases; D, deaths; P, present]

Place		Apr. 30–May 28, 1933	May 28–June 24, 1933	June 25–July 29, 1933	July 30–Aug. 26, 1933	Week ended— September 1933: 2	9	16	23	30	October 1933: 7	14	21	28	November 1933: 4	11	18	25	Dec. 2, 1933
Philippine Islands: [1]																			
Antique Province	C												9	8	2			6	8
	D												6	10	1			5	6
Bohol Province	C	15	80		1					6	1	28	6	52	35	31	39	[illegible]	71
	D	12	38							3	1	12	3	31	21	14	25	41	25
Cebu Province	C		2	90	26	1	9	6	11	12	22	16	15	10	23	18	7	23	15
	D		2	39	20	1	7	4	9	7	14	9	9	4	16	12	4	13	10
Cebu	C		1		1	1		1	2	5	6	6	3	6	1	11	4	1	
	D		1		1	1		1	2	3	2	3	1	2	1	6	[illegible]		
Naga	C														9	1	1	[illegible]	4
	D														6	1	1	1	3
Iloilo Province	C	1		1										12	1			1	
	D	1		1										11	2			1	
Iloilo	C	1		1											1			1	
	D	1		1											2			1	
Leyte Province	C	22	2		2		1												
	D	20	2		2		1												
Occidental Negros Province	C		19	6	1														2
	D		9	7	1														1
Pampanga Province	C	1																	
	D	1																	
Rizal Province	C	1																	
Samar Province	C	29	7		31					[2] 31	11								
	D	23	5		20					[2] 20	8								
Siam:																			
Bangkok	C	1	1																
Provinces	C	13	28	1															
	D	6	14	1															
On vessels:																			
S.S. Dunana at Madras	D	1																	
S.S. Lauterfels at Calcutta	C	1																	
S.S. Mathura at Calcutta	C	1																	

Place		May 1933			June 1933			July 1933			August 1933			September 1933			October 1933	
		1–10	11–20	21–31	1–10	11–20	21–30	1–10	11–20	21–31	1–10	11–20	21–31	1–10	11–20	21–30	1–10	11–20
Indo-China (French) (see also table above):																		
Cambodia [3]	C	11	14	17	23	31	14	3	1			1						
	D	8	10	9	12	17	6	3	1			1						
Cochin-China [3]	C	5	9	6	4	8	5	6	2	12	3	2	1	1	2	2	5	5
	D	4	8	6	4	8	4	5	2	3	3	2	1	1	2	2	5	3

[1] During the week ended Dec. 16, 1933, cholera was reported in the Philippine Islands as follows: Bohol Province—Calape, 3 cases, 3 deaths; Loon, 8 cases, 5 deaths; Tubigon, 11 cases, 8 deaths. Cebu Province—Liloan, 1 case, 1 death. Oriental Negros Province—Tanjay, 4 cases, 4 deaths.
[2] For 2 weeks.
[3] Reports incomplete.

PLAGUE [1]

[C indicates cases; D, deaths; P, present]

Place		Apr. 30–May 27, 1933	May 28–June 24, 1933	June 25–July 29, 1933	July 30–Aug. 26, 1933	Week ended— September 1933					October 1933				November 1933			
						2	9	16	23	30	7	14	21	28	4	11	18	25
Argentina (see also table below): Cordoba Province	C	8																
Azores:																		
Fayal	C								1									
St. Michaels	C								7									
	D								1									
Bolivia. (See table below.)																		
British East Africa (see also table below):																		
Kenya	C		8	7	13	2	6	3	10	9	16	2			8			
Tanganyika	D	1													1			
Uganda	C	85	53	58	77	18	34	22	21	18	8	22	15					
	D	83	53	58	77	18	28	23	23	17	7	22	14					
Ceylon: Colombo	C		1	2			1						1					
	D		1	2			1						1					
Plague-infected rats				4	1													
China: Manchuria.[2]																		

See footnotes at end of table.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Apr. 30–May 27, 1933	May 28–June 24, 1933	June 25–July 29, 1933	July 30–Aug. 26, 1933	Week ended— September 1933: 2	9	16	23	30	October 1933: 7	14	21	28	November 1933: 4	11	18	25
Dutch East Indies: West Java	C	878	793	1,434	899	248	299	289	294	335								
	D	872	789	1,428	898	248	299	288	294	334								
Ecuador. (See table below.)																		
Egypt:																		
Alexandria	C			4	1													
Asyut	C	10	2															
Aswan	C	1																
Faiyum	C		2	4			1	1			1							
	D			1														
Gharbiya	C									3	1			1				
	D									2	1	1		1				
Girga	C			2														
Minufiya	C	1																
Minya	C		4	1						1								
Qena	C				1													
	D				1													
Luxor	C				2													
France: Marseille	C				8													
	D				3													
Plague-infected rats					2											1		
Hawaii Territory: Hawaii Island—Hamakua—Plague-infected rats							1									2		
India	C	2,319	1,411	3,869	6,209	2,151	2,350	2,610	3,133	3,398	3,074	2,941						
	D	1,407	1,231	2,616	3,560	1,331	1,369	1,573	1,747	1,951	1,603	1,546						
Bassein	C	3	1	11	7			2		1								
Plague-infected rats		3	2	2	1													
Bombay Presidency	C			2,448	3,971	1,263	1,424	1,465	1,872	2,045	2,231		1,382	1,309	1,598			
	D			1,493	2,313	852	898	967	1,173	1,227	1,235		895	775	992			
Bombay	C	6	2	1	1	2	1	1	2	1	1	1		1		1		
Plague-infected rats		34	16	5	5			1		2	1				3	3	1	1
Poona	C										176		150	143	61			
	D										118	199	109	101	53			
Madras Presidency	C	23	8	372	867	253	190	183	273	282	231	100	95					
	D	8	6	148	395	136	77	83	111	140	139	56	46					
Rangoon	C	1	1					2			1							1
Plague-infected rats				3	1					2							1	1

Indo-China (see also table below):																		
Pnom-Penh	D	6	3	2	3	2					2							
Saigon and Cholon	C	2		2	3													
Plague-infected rats		3																
Iraq:																		
Baghdad	C	3	2	7		1	1		1			[3] 1			1	1		
Basra	C			3														
Libya: Gheran	C									10								
	D									3								
Madagascar (see also table below): Tamatave	C				1													
Morocco	C	2		8														
Peru. (See table below.)																		
Senegal. (See table below.)																		
Siam	C		2															
South-West Africa.[4]																		
Syria: Beirut	C		1	2														
Union of South Africa: Orange Free State	C	7																
United States: California:																		
San Benito County—Plague-infected ground squirrels					8													
Whittier	C				1													
	D				1													
On vessel: S.S. Angkor at Beirut from Marseille	C													1				

Place		May 1933	June 1933	July 1933	August 1933	September 1933	October 1933
Argentina (see also table above)	C			7			6
	D			3			2
Bolivia	C			25	1		
British East Africa (see also table above):							
Kenya	C	4	6	3	13	36	20
Uganda	C			47	91	97	71
Ecuador	C	35				3	
Indo-China (see also table above):							
Cambodia	D	3	5	3	6	16	8
Cochin-China	C	2		2	5	1	

Place		May 1933	June 1933	July 1933	August 1933	September 1933	October 1933
Madagascar	C			133	100		
	D			132	92		
Peru	C	3	5	6	7	8	18
Callao	C					1	7
Senegal:							
Dakar [5]	C	2		57		5	4
	D	1		39		3	3
Tivaouane [5]	C		1		5	2	

[1] Including plague in the United States and its possessions.
[2] In September and October 1933 plague was reported in parts of Manchuria, China, especially between the Ssupingkai-Taonan Railway and the southern line of the Chinese Eastern Railway, also adjacent to the lines of the Ssupingkai-Taonan, Ssupingkai-Tungliao, and Tahushan-Tungliao Railways.
[3] Imported.
[4] 103 cases of plague with 5 deaths were reported in Ovamboland, South-West Africa from Jan. 1 to Oct. 14, 1933. Antiplague measures have been taken.
[5] Incomplete reports.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Apr. 30–May 27, 1933	May 28–June 24, 1933	June 25–July 29, 1933	July 30–Aug. 26, 1933	Week ended— September 1933: 2	9	16	23	30	October 1933: 7	14	21	28	November 1933: 4	11	18	25	Dec. 2, 1933
Algeria:																1			
Algiers Department	C			2															
Constantine Department	C			1															
Arabia: Muscat—Oman Sultanate	C		73																
	D		20																
Belgian Congo	C			5		2	2												
	D			1															
Bolivia. (See table below.)																			
Brazil: Porto Alegre (alastrim)	C		6	1	1		1		1	10			1						
British East Africa:																			
Kenya	C	4																	
Tanganyika	C	13	10	6	21	9		16	2	3	12	12	24	4					
British South Africa:																			
Northern Rhodesia	C	2		1	1														
Southern Rhodesia	C	16		1				2											
Canada:																			
British Columbia	C	[1] 1	[1] 1																
Manitoba	C				1														
Ontario	C	[1] 1	[1] 1																
Toronto	C	1																	
Saskatchewan	C	[1] 5	7				[1] 1												
Ceylon:																			
Colombo	C	4	9	6	9											1			
Galle	C	2		1															
China:																			
Amoy	C	3	2																
Canton	C	7													1		1		1
Dairen	C	3	2	3			1					1	1	1	2				
Foochow	C	P	P	P															
Hangchow	C			3	1														
	D			2	1														
Hong Kong	C	19	8	3	1														
Macao	C	4																	
Nanking	C	2	2	2															
Shanghai	C	33	27	22	10	2		1	1	1	2			1	4	1		6	
Swatow	C	10	4									1	1		1				
Tientsin	C		16	2															

Chosen. (See table below.)																			
Colombia: Buenaventura	D			1															
Costa Rica. (See table below.)																			
Dahomey. (See table below.)																			
Ecuador. (See table below.)																			
Egypt:																			
Alexandria	C	11													1	2			
Asyut	C			112	109			17		26	6	8	21	5		1			
	D			23	11			3		3	1	1	1	1					
Beheira	C	62	6																
Beni-Suef	C							10	17	4	10	2	1						
	D							4	1	2	1	1							
Cairo	C	10	4	1						1									
Dakahliya	C			4	1														
Faiyum	C			44	18			2		1	1								
Gharbiya	C	93	142	53	39	4		1				1		1		4			
Girga	C			2	2							1	5	3					
Minufiya	C	128	26																
Qena	C			9	25			3	1				13	12		6			
Provinces	C	347	287	499	297	50	32	33		35	18	12	40	25	25				
France. (See table below.)																			
Great Britain:																			
England and Wales	C	91	71	55	32	4	2	6	4	4	3	3		4	1	1	1	6	
London	C	79	51	40	28	3		5	3	3	3	3		4	1	1	1	6	
London and Great Towns	C	82	56	49	31	3	1	5	3	3	3	3		4	1	1	1	6	
Greece (see also table below): Salonika	C	18		8					9										
Guatemala. (See table below.)																			
Honduras: Tegucigalpa	C	7	3																
India	C	33,876	23,631	14,599	7,069	1,765	1,509	1,156	1,377	1,245	1,136	1,107							
	D	9,706	7,008	4,256	1,768	430	345	268	321	261	310	215							
Bassein	C	32	16	9	10	4	1	4	7	3	3	3	2	4	5	3	2	2	4
	D	11	11	8	6	3	1		1	1	3		2	2	1	1	3	1	3
Bombay Presidency	C			1,942	1,029	198	170	174	202	129	130	191	127	151	121				
	D			376	186	40	38	20	46	16	23	14	29	25	22				
Bombay	C	212	88	34	14	1					2		1	1		2		2	3
	D	148	58	25	8	1					2		1	1		2		1	3
Calcutta	C	342	134	59	18	4	2	2	2		1	3		4	1	8		4	9
	D	289	107	49	8	2			1		1	1		1	1	1		3	1
Chittagong	C	1																	
	D	1																	
Cochin	C		2	4		2								1					
Karachi	C	52	19	16	5								2						
Madras Presidency	C			3,571	2,851	621	592	539	548	644	602	540	646						
	D			726	587	114	93	102	100	104	132	106	142						
Madras	C	231	144	234	223	63	33	32	36	45	30	22	13	16	13	7	7	14	14
Moulmein	C		12																
Negapatam	C	7	3	12	21	2	2	3		1		1	4	4	7		3	7	8
Rangoon	C	17	6	4	1	1		3			1					1		1	2
Tuticorin	C				2									1	5			1	
Vizagapatam	C	2	5	14	11				2			1			1			1	

[1] For 2 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—*Continued*

[C indicates cases; D, deaths; P, present]

Place		Apr. 30–May 27, 1933	May 28–June 24, 1933	June 25–July 29, 1933	July 30–Aug. 26, 1933	Week ended— September 1933: 2	9	16	23	30	October 1933: 7	14	21	28	November 1933: 4	11	18	25	Dec. 2, 1933
India (French):																			
Chandernagor	D			1															
Karikal	C		5							1	1								
	D		5							1	1								
Pondichery	C		129	139	181	57	50	40	24	39	59	25		17	15				
	D		82	73	70	22	25	17	22	18	32	19		12	7				
Indo-China (see also table below): Saigon and Cholon	C			1			1												
Iraq:																			
Baghdad	C	5									1		1				1	1	1
Basra	C	6	2			4									3				
Japan:																			
Kobe	C			1															
Osaka	C	1																	
Tokyo	C	1	2	45															
Mexico (see also table below):																			
Coahuila	C	1	2																
Juarez [1]	C	2																	
Mexico, D.F.	C	5	5	1	12														
Monterrey	D	2			1										1				
Saltillo	D	2	3																
San Luis Potosi	D	5	1	9	8														
Torreon	D									1		1	1						
Vera Cruz	C													1		1			
	D													1		1			
Morocco. (See table below.)																			
Nigeria	C			675	361			37		76		74							
Nyasaland. (See table below.)																			
Palestine	C			13															
Paraguay: Asuncion	D			3															
Persia	C	89	31	26	20			3	5	5		8	12	25					
	D	62	62	9	7				6	1		2	1	2	2				
Teheran	C			21	17	2			1		3	2		6					
	D			8	5				1		1		1	2	2				

Peru. (See table below.)																			
Poland	C	2	1	1										1		1			
Portugal (see also table below):																			
Lisbon	C	2	3	5	3			2	1										
Oporto	C	2		3	1								2					1	
Siam	D			5	1										1	1			
Sierra Leone	C	51	6	45	6	¹ 200		¹ 50				¹ 421		¹ 113					
Spain	C			59	29	11	5				4	7							
Sudan (Anglo-Egyptian)	C	5	1	5			1								27	13			
Syria:																	14	1	
Beirut	C	1	6	14	21														
Provinces	C	20	4	9	11	1			3	3	16			18	2	19	14		
Turkey. (See table below.)																			
Union of South Africa:																			
Cape Province	C	P																	
Orange Free State	C		P																
On vessels:																			
S.S. Rajputana at Aden	C	1																	
	D	1																	
S.S. Baron Inchcape at Hong Kong	C	P																	
S.S. Fernmoor at Vancouver	C		4																
S.S. Egra at Rangoon from Calcutta	C	1																	
S.S. Arracan at Newport	C				1														
S.S. Clan Macquarrie at Suez	C					1													
S.S. Sikh at Madras	C				1														
S.S. Lichtenfels at Suez from Calcutta	C									1									
S.S. Shahjehan at Madras	C							1											
S.S. Rohna at Penang from Madras	C														1				

Place		May 1933	June 1933			July 1933			August 1933			September 1933			October 1933	
			1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20
Dahomey	C	11	1	1		2	1		6	1	1	20	6	1	2	8
	D	2		1		1				1	1	5	1			6
Indo-China (see also table above)	C	149	60	83	54	74		31	20	38	21		44	37	39	20
	D	45	16	36	24	31		6	5	15	3		19	13	15	5

¹ For 2 weeks.

² Dec. 18, 1933: 90 cases of smallpox were reported in Juarez, Mexico, with 18 deaths occurring from Dec. 1 to 16, 1933.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		May 1933	June 1933	July 1933	August 1933	September 1933	October 1933
Bolivia	C	28	12	10	12	15	34
Chosen	C	34		3			
	D	14					
Costa Rica	C				2		
Ecuador	C	1 [3]	23	12			
France	C	21					
Greece	C				1		
Guatemala	C	1					
Mexico (see also table above)	C			9	31	18	
Morocco	C	14	10	8	1	2	3
Nyasaland	C	303	248	336	347	318	
Peru	C	6		84	56		
Portugal (see also table above)	C				89	105	
	D				16	27	
Turkey	C		13		8	56	

[3] Imported.

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Apr. 30–May 27, 1933	May 28–June 24, 1933	June 25–July 29, 1933	Week ended— Aug. 1933: 5	12	19	26	Sept. 1933: 2	9	16	23	30	Oct. 1933: 7	14	21	28	Nov. 1933: 4	11	18
Algeria:																				
Algiers Department	C	14	11	7	1	1									1					
Constantine Department	C	120	157	66	3	8		10	2	4	5	1	4	1		4				1
Bone	C	2		1		1												1		
Oran Department	C		1	2						2							1			
Basutoland. (See table below.)																				
Bolivia. (See table below.)																				
British East Africa: Uganda	C	10	7	4		2		2	3	1	5	2			1	1				
Bulgaria	C	8	4	2		2	1					1				3		1		
Chile	C						596	432	408	2,180										
Antofagasta	C		1																	
Santiago	C	134	290	1,112	392				124	282	233	218	214	224	292	343				
Valparaiso	C		1	7			8	5	5	8	11		10	4	8	22	9	5	12	24
China:																				
Hangchow	C				5															
Hankow	C												1							
Harbin	C						8	3												

Nanking	C			1		1								1						
Shanghai	C			1				1				1					1	1		
Tientsin	C			1																
Chosen. (See table below.)																				
Czechoslovakia. (See table below.)																				
Egypt:																				
Alexandria	C	24	17	18	1					1										
Beheira	C	560	569	257	16	21	14	10	7	3	2	4	2	8	5	2	9	9		10
Cairo	C	53	28	9	2	1		1				1								
Dakahliya	C	267	140	82	8	10	19	5	7	2	1	1	3						2	2
Damietta	C		3	3				1	1											
Gharbiya	C	448	591	310	22	10	19	28	11	10	8	9	3	1	1	8			3	5
Minufiya	C			52	4	20	4	8	1	1	2		2	3	5	2	2	2	3	
Qena	C								1			4	4			3			3	2
Provinces	C	1,611	1,591	785	54	63	56	53	29	22	17	25	14	13	12	15	12	14	29	20
Greece. (See table below.)																				
Guatemala. (See table below.)																				
Hungary	C	15	11													5		10		
Iraq: Baghdad	C	2	2	2		1														
Irish Free State:																				
Kerry County—Dingle	C														4			4		
Waterford County—Lismore	C					1														
Latvia. (See table below.)																				
Lithuania	C	31	15	1		8	2	1												
Mexico (see also table below):																				
Mexico, D.F.	C	15	9	6		1			2	2	2		10	5	3	6		14	15	10
San Luis Potosi	D												1	1						
Torreon	C						1			1	1								1	
Morocco	C	31	63	14	1	11			1	1				1	1					
Palestine	C		1	20		2		1	1	1			1				4	4		
Persia	C	39	25	21	9	4	2		4	1	3	6	10	8	5	6	1	5		
Peru. (See table below.)																				
Poland	C	378	322	196	27	19	3	7	6	8	12	8	17	17	8	23	18	34	41	21
	D	21	13	11	4		1	1				1		2	1		2	3		2
Rumania. (See table below.)																				
Spain: Madrid	C									1		1		1						
	D										1									
Syria	C	24	21	1		1		1												
Trans-Jordan	C	17	4	2																
Tunisia:																				
Tunis	C										1				2					
Provinces	C	42	65	36																
Turkey. (See table below.)																				
Union of Socialist Soviet Republics. (See table below.)																				
Union of South Africa. (See table below.)																				
Yugoslavia. (See table below.)																				
On vessels:																				
S.S. Chiloe at Antofagasta	C		1																	
S.S. Conte Verde at Bombay from Singapore	C	1																		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases: D, deaths; P, present]

Place		May 1933	June 1933	July 1933	August 1933	September 1933	October 1933
Basutoland	C	233		208	279	259	
Bolivia	C	98	71	36	34	99	129
Chosen	C			59			
Czechoslovakia	C	31	9	6	1		
Greece	C	12	6	5	4	4	
Guatemala	C	8	3	1	4	5	
Latvia	C				1		
Mexico (see also table above)	C			12	19	42	
Peru	C	28	23	20	60		
Rumania	C			57	22	13	21
Turkey	C	16	13	5	7	9	20
Union of Socialist Soviet Republics	C	2,051					
Union of South Africa:							
Cape Province	C	189	124	195	135	141	
Natal	C	6	122	23	18	43	
Orange Free State	C	15	34	61	140	180	
Transvaal	C	1	7	5	3	103	
Yugoslavia	C		136	89	33	5	38

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		Apr. 30–May 27, 1933	May 28–June 24, 1933	June 25–July 29, 1933	Week ended— August 1933: 5	12	19	26	September 1933: 2	9	16	23	30	October 1933: 7	14	21	28	November 1933: 4	11
Brazil:																			
Ceara State:																			
Lavras	C		1																
	D		1																
St. Matheus	C		1																
	D		1																
Pernambuco State:																			
Granito	C			2															
	D			2															
Novo Exu [1]	C			1															
	D			1															
Salgueiro	C	1																	
	D	1																	

French West Africa:																			
Guinea	C										[2] 1								
Niger Territory	C							2	1				2	1					
	D							2					2	[3] 2					
Gold Coast	C	2	1							[2] 1					[2] 1				1
	D									[2] 1									1
Ivory Coast:																			
Bouafle	C		1																
Gagnoa	C		[2] 1																
	D		1																
Nigeria: Kano	C																	1	
	D																	1	
Senegal:																			
Bakel	C											2			1				
	D														1				
Kaffrine	C														1				
	D														1				
St. Louis	D			[4] 1															

[1] 2 cases of yellow fever with 2 deaths were reported in Novo Exu, Pernambuco State, Brazil, during the month of June 1933.
[2] Suspected.
[3] Includes 1 suspected death.
[4] Imported.

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